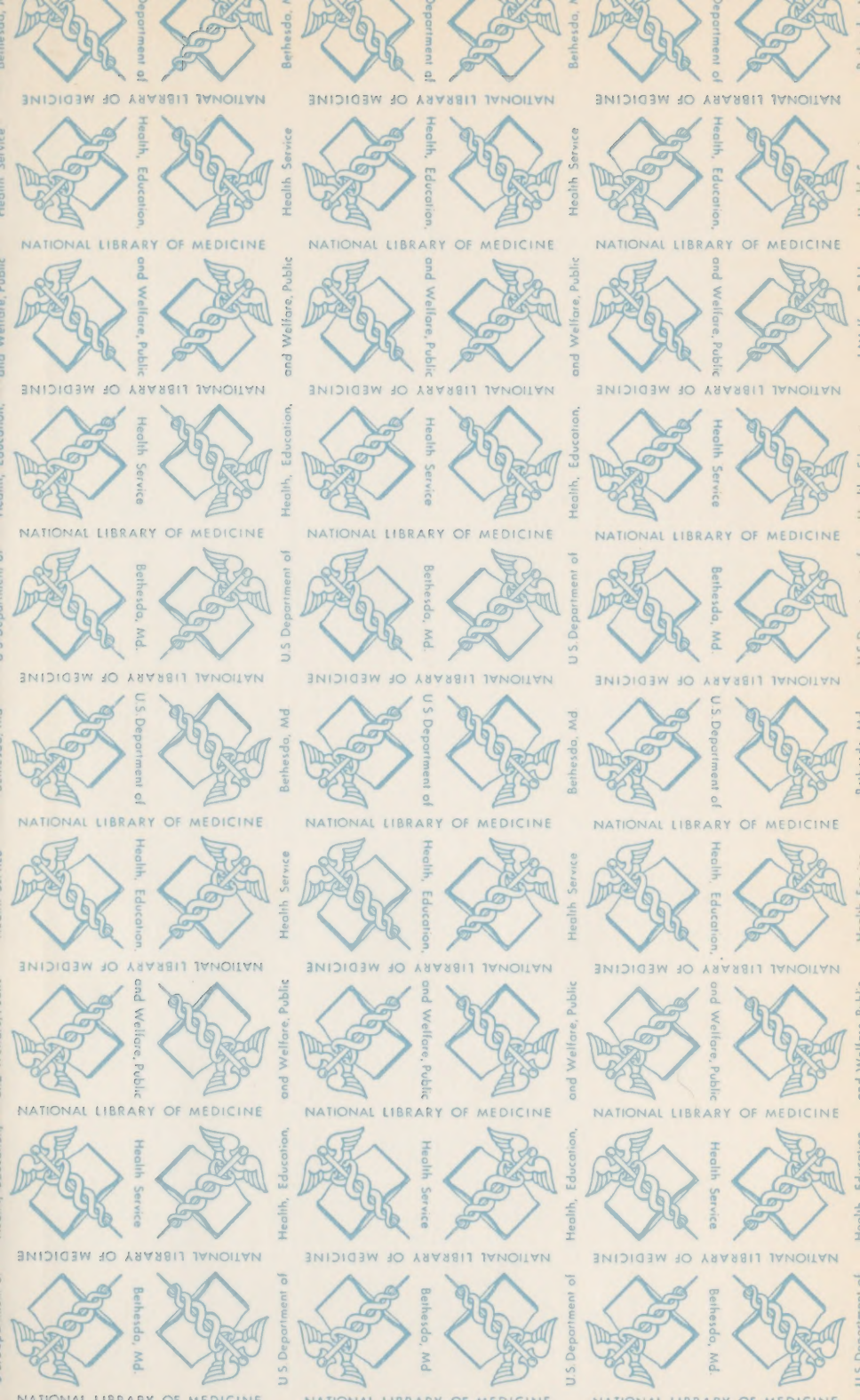
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Carver's Scientific Catechism

BEING

Studies Preparatory

TO

Chiropractic

WITH A

GLOSSARY

OUTLINED WITH SPECIAL REFERENCE TO PSYCHOLOGY, BIOLOGY, HISTOLOGY, EMBRYOLOGY, PHYSICS, CHEMISTRY, PRINCIPLES OF ARCHITECTURE AND MACHINES, WORD ANALYSIS, GEOMETRY OF CHIROPRACTIC, HOW TO STUDY ANATOMY, AND THE TRUTH ABOUT EATING

BY

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PRESIDENT

CARVER CHIROPRACTIC COLLEGE

OKLAHOMA CITY, OKLAHOMA

NEW YORK CITY.

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CARVER'S SCIENTIFIC CATECHISM

Being

STUDIES PREPARATORY TO CHIROPRACTIC

With a Glossary

As Outlined by Willard Carver, LL.B., D.C.

A person that would pursue the study of Chiropractic must realize at the outset that in order to grasp that science in its entirety and in its multitudinous array of details, must change his conceptions, to some extent, as to all previously entertained ideas of the different phases of science.

In order to aid a student in a preparation for that work it is necessary for him to become familiar with a very extensive scope of data, presented in such manner as to indicate the relativity of all truth, and to begin by disabusing his mind of its misconceptions, if such errors are entertained, that there are such things as distinct and separate sciences, and to make the point prominent that all truth is interdependent; that each truth

necessarily is a part of each other truth, and therefore that the attempt should never be made to consider one fact by itself.

This study outline is prepared with the idea of helping the student to grasp the thought of the oneness of truth, and incident thereto, to grasp the thought of the oneness of intelligence, life, force and matter. In other words, to help the student to understand that matter at all times is constantly responding to phases of force, and that the plural of the word, FORCE, is no more nearly correct than the plural of matter. It is therefore as completely erroneous for the scientific student to talk about "forces" when referring to phases of force, as it would be for him to talk about "matters" when he is referring to phases of matter, or "intelligences," when he is speaking of the phases of intelligence, or lives, when he is speaking of the phases of expression of life.

In order to make the study of the science of Chiropractic convenient, it is considered as being divided into two grand divisions, as follows:

I

The first of these divisions requires a very comprehensive knowledge of the human organism, and in the broader and better sense, a very comprehensive knowledge of the human being, as revealed in the following departments:

a. As a biologic machine.
b. As a physics machine.
c. As a mechanical structure representing the highest

ideals of all phases of structural architecture in one aspect, and of machinery in the other; for of course, it will be remembered that machines are one aspect of architecture, and buildings are to a certain extent representative of machinery.

In order to prepare one for an investigation of a subject of such scope and complexity, it is necessary for him to become very intimate with the basic principles of many phases of subject matter. This is made peculiarly necessary by reason of the fact that it has been the habit of students and scholars down to very recently, to attempt to look upon different departments of learning as distinct sciences, and this has rendered it necessary for those who would master any subject, at this time, to take a little—all that is true—out of many baskets; therefore, the following subjects must be very carefully investigated, to the end that the student will be prepared to understand the phases of Relatolity, hence the harmony of the science of Chiropractic with all other truth: therefore, the student is cautioned to follow out quite at length the subjects following, in the order in which they are given:

Psychology.
Biology.
Histology.
Embryology.
Physics.
Chemistry.
Principles of Architecture and Machines.
Word Analysis.

Geometry of Chiropractic.
How to Study Anatomy.
The Truth About Eating.
Glossary.

II

The second subdivision, for the purpose of acquiring knowledge necessary to an understanding of the science of Chiropractic, directs itself to the subject of relation, and the details incident thereto, as the same are found in architecture and in actual machine devices.

This knowledge is necessary in order that the student may get a very complete comprehension of what is meant by DISTORTION, as the word applies to animate architecture and machinery, such as the human body, and displacement, which word properly applies only to inanimate machine devices, such, for instance, as an automobile.

To understand distortion, furnishes the student with phases of truth for consideration incident to any locality in the human, animate machine, and the effect of that or any distortion as it operates upon the whole animate machine. In order to aid the student's comprehension in such matters, phases of displacement in inanimate machines have been suggested which are to be considered locally and generally, as aids to an understanding of distortions in animate architecture or animate machines.

The student will find much help as a primary study in the mastery of the following subjects:

Application of Force to Matter, as the same has been presented in physics.

Rudiments of Structural Architecture, as the facts stated in the principles of architecture are correctly styled, when each law is considered by itself.

Geometrical Figures and Lines.

Terminology of Geometrical Figures.

METHOD OF PRESENTATION

The method of presenting the subjects herein covered is by questions and answers. The question is always specifically directed to the thought that it is desired the student shall acquire; or, to the elucidation of the fundamental proposition which it is particularly desired the student shall comprehend, and therefore, of course, each question presents phases of the subject which the student is cautioned to carefully investigate and master.

The answers given to the questions propounded are intended to be terse, succinct presentations of the truth, where the truth is definitely and well known; but if the matter depends upon qualified information; to state, as nearly as possible, the greater weight of authority. In this connection it must be explained that such phases will only be presented at the rarest intervals, and then only when it is conceived that the presentation of the weight of opinion will clarify the field for the student making the investigation.

It is, therefore, urged upon the person pursuing this study to give the most careful attention, first to the questions as they are asked; for the author, in a long

experience as a lawyer and doctor, has learned that one of the most difficult things that a person accomplishes is to understand with clarity the very question propounded to him.

The wide discrepancy of conception and the endless and unnecessary argument incident to almost all phases of things would be entirely avoided if people would only pay more attention to the actual question that is presented. For to understand what the question is, is to have it considerably more than half answered.

If the student will, therefore, very carefully read each question and bring himself to a complete understanding of what is being asked and presented in the answer thereto, he will save himself the necessity of going into a broader field, without comprehending the principle he is to understand, thus being confused by a great array of data; but will get a clear and well-defined conception of what it is necessary for him to know in order that he may take up and pursue in an intelligent manner, with the least loss of time, and with the greatest economy of results, the study of the science of Chiropractic.

PSYCHOLOGY

For the purpose in view no author on Psychology will be cited, for it is not the intention of the author of this outline to give the student the details of that subject, nor is it the intention to go into any of the ramifications of the subject as they may be abstractly considered.

It is the intention by the questions presented and answers made, to completely cover the incipient biologic aspects of the entire subject of Psychology, merely for the purpose of having the student understand in a fundamental manner what relation the great universality comprehended under the term, Psychology, sustains to the actual fact of animation in the human organism, from its very beginning to its maturity, and thence to its dissolution, which has been incorrectly called death.

While no authorities are cited, it is suggested to the student that if he wishes to pursue a wider course of study for the purpose of developing himself in the subject of Psychology, he would do well to read the Psychologic department of "Psycho-Bio-Physiology," as a beginning book, by the author of this study outline, and then proceed to read "The Law of Psychic Phenomena," by Thompson J. Hudson, and the "Psychic Series," by Edward B. Warman.

If the student will permit it at this point, the author would advise him not to read more widely than the books

suggested, until he has made himself very sure that he has mastered all that is within those books, for there is no subject upon which there has been so much trashy literature produced as upon the subject of Psychology, and particularly upon what might, for want of a better term, be called its bizarre phases.

INTRODUCTION TO QUIZ

Psychology is the most comprehensive and important theme that can engage the attention of human beings, and it is of the first importance that each student who would study the science of Chiropractic shall have a clean-cut comprehension of the basic principles of Psychology in order that he may readily take up the phases of truth in their proper, normal, sequential order.

The basic principles of Psychology are few and simple, but they are indeed far reaching and comprehensive, and if the student gets a misunderstanding with respect to the basic principles, or fails to clearly and separately impress them upon his mind, he may never know that he has made an error, and those who come in contact with him may not find out that he has made an error, particularly his teachers; and because of such errors, he may never become proficient in the science of Chiropractic, and that is why he is so definitely urged to be certain to master the fundamentals now.

Please permit the caution that it is not the amount you read in Psychology that makes you a Psychologist, but it is the complete and careful understanding of the fun-

damental principles of Psychology, and then the amount you understand, as these fundamentals are related to the whole subject, and finally, how well you understand the relation between Psychology and all other phases of truth. Therefore, go slow. Be careful, and painstaking. For the subject is beset on all sides by wild, distorted, injurious fancies. Keep to the plain and common sense, for there is nothing but common sense in the science of Psychology.

The very question that the student should investigate, and therefore, fully understand, is sometimes most difficult to ascertain. In this study outline such subjects are most carefully propounded and the answers thereto are as completely and carefully given as the immediate necessity of the work permits or necessitates.

PSYCHOLOGY QUIZ

1.—Why should the student preparing for the study of Chiropractic make a somewhat extended study of Psychology?

A.—The reason is three-fold: a. He should study Psychology in order to inform himself of the way in which the material body is constructed and maintained, for he must know that construction and maintenance are accomplished by the operation of intelligent, soul force acting upon inanimate matter, converting it into animate matter, or causing it to enter into physiologic performance. b. In order to understand in connection with the material construction of the body how mind is produced, as one phase of the functioning of certain parts of the

brain. c. By observing the facts of the influence of soul intelligence and force upon the body, to understand what may be learned in that manner of the soul and its attributes.

2.—What have been the ways of studying the soul up to our time?

A.—It has been studied as mental philosophy, metaphysics, and through the multitudinous phases of the different religions, that have existed; for of course, each religion in one aspect of it is psychologic.

3.—What is Psychology?

A.—Psychology consists of the truth which has been collected by a careful observance of the phases of conduct of the human organism, with more particular reference to the intelligence department. However, Psychology applies as well to all departments as to that of mentality.

4.—What is the science of Psychology?

A.—The science of Psychology consists in the systematized and classified facts which constitute the composite of truth respecting that subject, that is to say, the phenomena of construction and functional operation of each department of the human body separately and collectively; but has been more definitely considered to be related to the mental part, which is erroneous.

5.—Why must we be very careful in the selection of language in an attempt to discuss Psychology?

A.—Because in the soul realm there is no language. Our discussion of the soul must be accomplished through our material organisms, and must be accomplished in

spite of all we can do, to a large extent, through conceptions that are physical or material, and in terminology that, after all, is wholly the result of material experiences.

6.—What is the soul?

A.—The word, Soul, and our conception of the soul, were not given to us originally. Both the word and the conception are the inventions of man. What we mean by the word, soul, is that immaterial, indestructible part of a human being, which we sometimes call life; that part, therefore, of which we cannot describe death, nor cannot describe as ceasing to exist. It is the immediate cause of our material person, and is the beginning of what we recognize as our individuality, which we conceive to be the intelligence and power which causes all physical phenomena with respect to our person to take place.

The soul is, therefore, that somewhat of life between material man and the Great Soul, related to both and necessary to both.

7.—What is the history of the word, Soul?

A.—The word, soul, came just as all other words have. A phase of phenomenon began to be recognized, and those who recognized it desired to express it, and in the effort to do so finally fixed upon the word, soul, as a token or indication of that particular phase to which they desired to direct the minds of others. It is a word used by both materialists and religionists, by monists, dualists and triunists. All of these, however, are parts of the same conception.

8.—What is mind?

A.—It is one phase of the functioning of the physical brain. Mind has been individualized to a large extent in the conceptions of mankind, and in that sense is looked upon as an entity, and we have a way of speaking of "the mind." This is entirely incorrect. Instead of the word being a noun it should be made a word of action, and should never be spoken of except with the thought of action. Instead, therefore, of the word being MIND, it should be MINDING. Just as when we use that phase of our mental department we call it thinking or remembering. We sometimes use the word memory, in a somewhat static sense, but when we use the word memory we are always thinking of action, and so we should always think of action when we think of mind. For the phenomenon that we call mind and should call minding, is only the result of the conduct of a certain portion of the cortex of our brain acting under the influence and direction of soul intelligence and force. If it acts correctly we speak of it as being sanity. If it acts abnormally we speak of it as being insanity. However, one never has an insane mind. He only has an unsound brain, which cannot function in such way as to produce minding that is sufficiently harmonious and systematic to meet with our conceptions of sanity.

9.—Has the soul a mind or anything that corresponds to the minding process?

A.—The soul, being immaterial, could by no possible stretch of the imagination be said to have mind. To say that the soul has "a mind" would be equivalent to saying

that the soul is material, is composed of physical parts, and is capable of functioning as physical parts do, which it is well known is not true. In the soul realm there is no use for mind, minding being necessary only while the soul occupies the body or person, so minding is confined to the human.

10.—Why have psychologists thought that the soul has mind?

A.—Psychologists have conceived that the soul only operates within the intelligence department of man. They have realized that all intelligence comes to man through the medium of the soul. They have observed a subtle character of intelligence, for which they have not been able to account, and have therefore erroneously conceived two phases of intelligence—first—the human phase, which they have called the objective mind; and second—what they have conceived to be the soul phase of intelligence, which they have called the subjective mind, the subconscious mind, the subliminal mind, and so on.

Psychologists, in recognizing that intelligence comes from the soul, have been incapable of separating mind from the transmission of intelligence, and have, therefore, thought the soul was thinking, when, in fact, all the soul does is to convey to that part of the brain in which consciousness is produced and maintained the substance of thought, which it impresses as memory. There is no occasion for but two words, allowing mind or MINDING to represent the physical functioning in the intelligence department incident to the influences and compulsion of

the soul, and to refer to the other phase as Psychic intelligence or soul intelligence.

11.—Biologically, with what is mind, as a phase of functioning, compared?

A.—It is perfectly logical to compare it to the function of any organ of the body. The conduct of the heart, the stomach, the liver, or any other so-called organ of the body is performed in precisely the same way as the brain operates in that part of it, which functions to the production of mind, or what we have suggested as being a better term—minding. In other words, there is no difference, biologically speaking, between digestion and minding, as two phases of function, or two phases of results of organic operation.

12.—What are the phases of the so-called mind?

A.—Mind has two offices. Its first office is to receive from the soul impression, the substance of memory and thought, in order to construct in the brain the seat of consciousness, memory, etc. Its second office is for the general guidance and control of the person while remaining animate on earth, and therefore to receive information as to the material realm and transmit that phase of information to the soul for its use in maintaining the person and carrying on each and all of the functional operations of the body during animation.

13.—Of how many parts does the intelligence department of man consist?

A.—Two. Mind (minding) and Soul.

14.—What character of terms should be used to indicate or refer to the soul?

A.—Only those which recognize its immateriality and its existence wholly separate and apart from all material assistance. It should, therefore, never be spoken of as being subject, less than, under, or in any way inferior to mind, but always as the origin and source of all mentality, or human knowledge; for while that portion of information respecting this material environment must be transmitted to soul through mind, the soul gives to the brain the capacity to perform this kind of function, which always marks its superior relationship.

15.—What means are at our command for ascertaining knowledge of the souls of human beings?

A.—Primarily, through that phase of intelligence which we call mind. However, the revolutionary proposition that has enforced itself upon us is, that in conjunction with mind we obtain knowledge of the soul through every phase of anatomic construction and physiologic and pathologic operation, for we as readily learn of the soul through the functioning of the heart, the spleen, the kidneys, the lungs, etc., as we do through the brain, in that part of it which functions to the production of what we call mind.

16.—Do the facts just stated present a very important duty to a human being?

A.—Yes. It is the paramount duty for each individual to become very thoroughly acquainted with the human machine; that is, to thoroughly understand each department of his anatomy, and to know how each part functions, and the functional relationship which each part sustains to each other part.

17.—What limitations characterize all of the attributes of mind except one?

A.—Each attribute of mind is limited to this physical existence, does not transcend this material phase, and plainly must cease to exist with material animation. The attributes referred to are memory, sensation, consciousness, reason, passion, love, will, hate, jealousy, etc.

18.—Is there an attribute of mind not limited to the physical or material existence?

A.—Yes. Mind possesses at least to some degree what has been called intuition, which is more properly called deduction; that is, the ability to know and realize all that is wholly within or related to a basic or primary truth; in a sense, the potential capacity to detect or become conscious of all phases and applications of a department of truth.

19.—Is that phase of emotion which at puberty, and indeed from the inception of consciousness, which urges toward reproduction or construction, and which is neither asked for, hoped for, nor desired on the part of the individual, but comes to him as a part of his development, included in the attribute which we have called intuition —deduction?

A.—Yes. Completely so. Because the urge to procreate our kind is as completely a part of knowledge which we derive directly from the soul as is any other phase of deduction—intuition.

20.—Are there attributes of mind that we may conceive could be perfected?

A.—Yes. We may conceive that deduction could be

multiplied to perfection, which would be all knowledge; but the same cannot be said for any other attribute of mind. Reason would cease to exist with perfect knowledge. So would imagination, comparison, material love, jealousy, hatred, and all the other attributes of so-called mind.

21.—Does the fact that mind possesses the attribute intuition—deduction—tend to establish its relationship to a phase of intelligence and power outside of the physical or material realm?

A.—Yes. The fact that mind possesses an attribute which can be conceived as being multiplied to perfection, proves its immediate relationship to the soul of man, and incidentally its relationship to the Great Soul, or the Supreme Intelligence and Power which constructed and controls all things.

22.—Is the same test which has just been applied to mind, also applicable to the soul?

A.—Yes. It is the only means which we possess for appraising the soul, and by this test we find that the soul has no attributes, which are not capable of being multiplied to perfection. The soul has place, intelligence, power and constructive urge; these in potentiality, which multiplied to perfection would be omnipresence, omniscience, omnipotence, and universal constructiveness, which has been conceived as formative or perfect love.

23.—What remarkable fact does the investigation of the question last asked bring to our attention, as a part of its answer?

A.—The remarkable fact that the soul is not possessed

of any attribute or quality which may not be conceived as becoming perfect. It is, therefore, not possessed of any of the attributes which have been ascribed to mind, not even that of intuition—deduction, for these require the minding process.

24.—The distinguishing attributes of the soul being presence—knowledge—power—constructive love, all in potentiality, what would they constitute if multiplied to perfection?

A.—They would represent our most complete conception of the Great Soul of the universe—God—from which conception we derive all our thoughts of perfection, and aside from such conception we have no thought of perfection.

25.—With the four attributes mentioned conceived as having been brought to perfection, what conception as to death is it logical to form?

A.—We cannot conceive such qualities ceasing to exist, and for this reason we cannot conceive the death of the Great Soul, or God.

26.—Does the fact that we cannot conceive the death or passing out of existence of God, because of being possessed of the attributes suggested, enforce upon us any other mental ultimate?

A.—Yes. If the soul of man possesses the same qualities as God in potentiality, then it cannot be conceived as passing out of existence, for in all things except quantity, or completeness, it is precisely like the Great Soul.

27.—Does the fact that the soul is possessed of constructive knowledge and power furnish us with any in-

formation of value as to our construction and animation?

A.—Yes. It furnishes abundant proof that the soul continually constructs the body—physiologically if the circumstances permit—pathologically if the circumstances are adverse—until adverse chemistry incident to distortion, renders maintenance of animation no longer possible.

28.—Does the possession, by the soul of man, in potentiality of omnipotence, omniscience, omnipresence and constructive love negative the possibility of possessing qualities of lesser value?

A.—Yes. Most certainly. It is impossible to conceive God as possessing any of the attributes which we have ascribed to the minding process, or to so-called mind, such as anger, jealousy, pain, reason, comparison, imagination, etc., for the very satisfactory reason that God knows everything, and has all power, even that of original construction, which renders it impossible that anything could occur not completely in accordance with universal intention. The soul of man, being possessed of the same qualities in potentiality, it is impossible to conceive that the soul of man is possessed of any other attributes except the four ascribed to God.

29.—What is the relation of mind to soul?

A.—The relation of mind to soul is just the same as the relation of any other function of the body to soul. In other words, mind sustains the same relation to the soul that stomach digestion sustains to the soul—that the production of bile sustains to the soul—that the production of leucocytes in the sinuses of the lymph glands

sustains to the soul—that the production of spermatozoa and ova sustains to the soul.

Mind is the agent which the soul uses to investigate the conditions of this physical or material realm. All information the soul will ever have of this material existence it must obtain through mind.

This is an important proposition when it is remembered that we have all phases of mind, from the incipient and trivial, sometimes expressed by the idiot or simple person, up to the most profound mentalities that the world has known, and yet in a certain sense these are on a parity, for any grade of mind can be completely lost by mechanical distortion and chemical adversity.

Soul has no mind. It is incapable of reason. It believes all that mind transmits to it, and this is the strongest proof that it possesses the four qualities only that may be multiplied to perfection, and also establishes the fact that mind is the sentinel at the gateway of the soul if we strive for it, to prevent the entrance of things that are untoward.

As to this answer, the student would do well to turn to the psychic department of Psycho-Bio-Physiology and read with great care all that is there said upon this subject.

30.—Since mind is the physical agent of the soul, what important truth should we learn effecting our mind from soul relationship?

A.—We should learn that the substance of all that we know, not confined to the material world, we get from the soul telepathically; and we should also learn that our

ability to cope with and command a knowledge of the physical realm, in which we exist, comes from the soul, and that the only thing that mind accomplishes which the soul without it could not accomplish, is the character of information that we obtain through our five senses; that is to say, what we obtain through seeing, smelling, tasting, hearing and feeling—five phases arbitrarily considered, but really but one, for really these phenomena are but one in the last analysis. In other words, we feel through our eyes, through our ears, through our nose, through our tongue, as completely as we do through any other part of the body.

We must learn that since the soul is not possessed of reason, it is the first duty of mind to reason out all physical things and transmit the accurate result thereof to the soul, and never to transmit that which is not true to the soul, for the soul constantly acts upon what is transmitted to it, as though it were the truth. In this fact lies the whole possibility of adverse auto-suggestion.

We should also learn that all that we understand comes to us through the medium of telepathy; that is to say, transmission of intelligence from the soul, for even our power to conceive the physical is telepathic.

31.—Do we have revealed to us the necessary truth for evolution?

A.—Yes. The soul radiates to mind the substance of truth necessary for physical evolution and growth. In other words, mind is capacitated by the soul, if used with sufficient diligence, to learn and comprehend all truth that is necessary for the physical body's upbuilding

and maintenance, and each person mentally superior to idiocy is impressed with the necessity to know his body, to understand the laws of his being, to understand the mechanical construction and functional operation, in order that he may perpetuate and maintain his body. Many do not give this fact heed, and neglect to accomplish much along this line of truth, but all that have minds have the urge to learn sufficiently of these things.

32.—What is suggestion?

A.—In the broadest sense suggestion is anything that affects the attention of the observer or recipient of the influence. Such, for instance, as sunshine, shadow, hate, light, moisture, dryness, water, fire, color, heights, depths, solidity, porosity, and a multitude of others, which may be well left to the fertility of the student.

Specifically, a suggestion is an influence conveyed from the mind of one person through the mind and to the soul of another, which attracts that other's attention and to some extent influences his mind attitude—not necessarily in the direction desired by the precipient, but nevertheless attracts the attention and influences the mental attitude of the recipient.

Of course, it follows as a necessary sequence that a suggestion may reach the seat of unconscious sensation, affecting physiologic action, and may affect it adversely to the production of remarkable pathology, and under certain well-defined and circumscribed conditions suggestion may have the reverse effect, overcoming the pathology and restoring physiologic conduct.

33.—What are the general errors as to suggestion?

A.—Incident to the incorrect teaching of so-called psychologists, the idea is quite generally entertained that suggestion is a mysterious or occult phase of conduct. Nothing could be farther from the truth. It is also thought that when certain persons peculiarly endowed attempt suggestion, suggestion is accomplished. That may or may not be true. It is also thought that a hypnotist possesses unusual, peculiar powers of suggestion. That is not true. It is the method used and not the power that makes the difference.

34.—Generally speaking, when is a suggestion accomplished?

A.—A suggestion is accomplished when by any of the means indicated in the last several answers, such as irritation, heat, cold, etc., or by means of speech, writing, music, pictures or what not, the attention has been commanded, the substance of the intelligence of whatever character has reached the soul of the individual, and has evolved into his consciousness.

35.—What is the technical psychologic meaning of suggestion?

A.—Speaking solely from the psychologic standpoint, a suggestion is the transmission of the substance of intelligence from the mind of the precipient through the mind of another or others, in such manner as to reach the soul or souls, and be evolved above the threshold of consciousness. The student must carefully differentiate this definition and understand that it is completely confined to psychology, for of course, it must be remembered that a suggestion in the true sense of the word

may just as easily be accomplished and still never rise above the threshold of the individual's consciousness. This when the intelligence applies itself wholly to that part of the brain in which the seat of tissue sense is located, affecting the recipient physiologically or pathologically, depending upon the character of the suggestion.

36.—What are the three classifications of suggestion?

A.—(1) Suggestion from all extraneous sources, such as has been illustrated by irritations of whatever character, by ordinary contact with the environment, such as heat, cold, moisture, etc.; and that phase which is transmitted by speech, writing, signs, tokens, music, art, etc. (2) Auto-suggestion. Meaning suggestive response from the soul of the individual himself, operating through his mind to the production of certain phases of mental attitude, belief, and therefore conduct, and acting also upon his body to the production of physiologic conduct or pathologic conduct, dependent upon the character of the attitude and continuity and gravity of the suggestion. (3) Suggestion through the seat of tissue sense, increasing, decreasing or changing the physiologic conduct of the body, perhaps to the extent of producing grave pathology. This phase of suggestion is beautifully illustrated in the blush of the maiden—the flush of excitement—the pallor of fear—and many other phases of physiologic or pathologic conduct.

37.—When is the soul amenable to control by suggestion?

A.—First: When the brain is functioning with sufficient normality to produce mind capable of translating

vibration as it is transmitted from the physical environment, for the soul, in such manner that the substance of it will be evolved into consciousness, and remain as memory. Second: When the situation exists as given in first, and mind is willing to accept and does accept the suggestion and transmits it to the soul. Third: The soul is amenable to control by suggestion when the brain and nerves are functioning to the transmission of vibrations in such way that they may be translated and evolved above the threshold of consciousness in the one case, and evolved into tissue sense in the other. The last being the means by which the soul is advised as to the state of physical being, and is also advised when the time comes that it must withdraw from the clay that it can no longer animate.

38.—When is the soul not amenable to control by suggestion?

A.—The soul is not amenable to control by suggestion when the brain and nerve system or any part of it is in such condition that vibrations from the physical environment cannot be carried through to the soul in such way that they may be translated. In such a situation it is impossible to convey the substance of information through that part of the brain in which consciousness is produced, and it is equally impossible for intelligence to be conveyed through the department of tissue sense.

39.—What lesson should we learn from the last answer?

A.—We should learn that the soul is not laid bare to this world. It has at its threshold the human organism,

which, through that department of its functions called mind, common sensation, special sensation, and tissue sense, protects the soul so long as sufficient normality of material consistence remains, that through these means the soul may be advised of environmental circumstance. It should also be remembered that when adverse conditions render these agencies no longer able to protect the soul, it, by virtue of that fact, withdraws from the influence of the physical environment by the process of dissolution, erroneously called death.

40.—Psychologically speaking, what are the two methods of giving suggestion?

A.—First: When one knows a suggestion is being given to him and is willing to receive it. This phase of suggestion not only includes those which appeal primarily to mental phases, but also to those from the physical environment, such as heat, moisture, coldness, roughness and the like, and those conveyed by gestures, signs, tokens, etc. This character of suggestion is always given affirmatively and in the form of direction or command. We receive the suggestion but may resist its effect. Second: A suggestion to an individual without his knowledge or consent, which may be a phase of transmission through tissue sense, and may include written and spoken words, gestures, signs, tokens, etc., and those which appeal through what is ordinarily called the special senses and common sensation. Such suggestions, when directed to the intellect, must be given passively, and in the first person, as though the individual himself was thinking and arriving at conclusions. There-

fore, when giving such suggestion, the precipient holds the thought, as, "I (for you) will do so and so."

41.—For the purpose of distinguishing it, what do we mean by a specific suggestion?

A.—We mean a suggestion given for the accomplishment of a definite and specific purpose, as distinguished from any general purpose. For instance, we may wish to cultivate the memory of a child. The suggestions then given are specific in their nature, and addressed to that accomplishment.

42.—What is telepathy?

A.—Telepathy is a transmission of the substance of information from the soul of the sender to that of the receiver or receivers. Of course, it must be understood that this definition necessarily includes the substance of information being sent from the mind of the precipient to his soul, with command to be transmitted to the soul of another, or to others, in such a way as to be evolved above the threshold of consciousness of that other, or those others. It used to be thought that telepathy could not occur between more than two. It is now well known that there is but one precipient, but there may be any number of recipients.

43.—When is suggestion telepathy?

A.—When there is transmission of the substance of intelligence from a precipient to a recipient with intention that it shall rise above the threshold of his consciousness, and become a matter of actual knowledge and memory to him.

44.—How is suggestion in telepathy given?

A.—It must be given in the first person, singular, as if the precipient was talking for the recipient. The number of words should be reduced to the very fewest that will state the fact and the substance of these words must be held on, over and in the recipient until the transmission has occurred, and the evolvement above the threshold of consciousness has taken place, or is ready at the first opportunity to take place.

45.—Is telepathy a common experience?

A.—Telepathy is one of the most common experiences of humanity. Every baby learns to talk by telepathic communication. Our incipient knowledge of mathematics comes to us telepathically. Much of the greater part that we think we know, we receive by telepathic communication; much of this, however, not by specific intention on any one's part, but by unconscious sending and receiving of telepathic communications.

46.—What is the relation of belief to telepathy?

A.—Belief is an essential to the receipt of telepathic communications. That is why communication without intention is constantly taking place. The individuals involved are willing that it should and it does. But in order to receive a specific telepathic communication, specifically sent for that purpose, not only the sender must believe he can send and have it received, but the recipient must believe that the message can be sent and that he can receive it. Otherwise, failure will mark every effort.

47.—In recent years has invention added faith in telepathy?

A.—Yes. The transmission of information by telegraph, then by telephone, then by wireless, and now by radio, has placed telepathy in such a position that only the willingly ignorant make any attempt to deny it, as a part of the ordinary phenomena of existence.

48.—What are the classifications of telepathy?

A.—Volitional and involitional telepathy.

49.—What is volitional telepathy?

A.—Volitional telepathy is the transmission of intelligence by specific intention on the part of the precipient. This has been variously referred to in the terminology of psychologists. It has been called mental telegraphy, mind transference, mind reading, thought transference, etc. The essentials are that the transmission shall occur between souls without physical intervention, and with specific intention on the part of the sender. It is then volitional telepathy.

50.—What is involitional telepathy?

A.—It is the transmission of the substance of intelligence without specific intention or effort, even on the part of the precipient.

51.—Which is the most used, and why?

A.—Involitional telepathy. This phase is constantly occurring between loved ones, and true friends, and persons enthusiastically joined in the advancement of the same cause. In such cases there is constant rapport and a willingness on the part of all precipients that the substance of their thought shall be transmitted to their loved ones or their compatriots, and willingness on the part of their loved ones and compatriots that substance of infor-

mation extended shall be received. This establishes a condition which insures successful transmission and receipt.

52.—What is the value of volitional telepathy?

A.—Volitional telepathy is of great assistance in establishing friendships, removing enmity, securing coöperation, aiding persons who have peculiar weaknesses, those who are subject to pronounced and continuous adverse auto-suggestion, aiding people who are sick to recover, overcoming adverse conclusions, misunderstandings, and a multitude of things of like nature; the reason being that all of these things can be accomplished without the recipient ever knowing that he is the subject of volitional telepathy. If he should know that volitional telepathy was being attempted it would usually fail.

53.—Is telepathy an aid to diagnosis?

A.—Yes. For the soul of the subject, through the seat of tissue sense, knows the condition of each part of the body, and the individual is perfectly willing that the truth shall be known. Now, if the examiner can bring himself into rapport with the subject, he will receive a wealth of involitional telepathy, which will be of the most pronounced advantage. This, always, provided he has carefully trained himself to the translation of such impressions.

54.—Has intention or willingness anything to do with success in telepathy?

A.—Telepathy cannot be accomplished without the willingness and intention of the recipient to receive communication. If the recipient fixes his intention not

to receive, no communication will be accomplished with that subject. It has been thought that only persons of a certain type may engage in telepathic communication. This is erroneous. All persons can send and receive telepathic communications who believe that they can and make themselves willing to do so.

55.—What are the steps for volitional telepathy?

A.—The precipient must have: a. Faith that he can send a telepathic communication; b. He must persist in that faith; c. He must carefully form the message in as few words as possible, and hold the substance of the message, as it were, over, on and in the recipient, until it has been received; d. The precipient must continue to hold the thought after sending the message; that is, keep constantly in his mind the substance of the message sent, holding it, as it were, over, on and in the recipient.

56.—When will there be no involitional telepathy?

A.—When the precipient or individual has instructed his soul that no communication shall occur in regard to a particular thing. Much error has been indulged in this department. It has been supposed that an individual could be hypnotized and made to divulge a secret, such as a crime. The Bells, in which Henry Irving won his fame, was based upon this hypothesis. Nothing of the kind can be accomplished. When mind has instructed the soul that upon a given subject no communication shall be permitted, there will be no involitional telepathy upon that subject.

57.—What is hypnotism?

A.—Hypnotism is a branch of psychology, which deals with the peculiar phenomena called sleep.

58.—What is hypnosis?

A.—Hypnosis is a phase of sleep superinduced by specific suggestion, which places mind in abeyance for the time, to a partial or complete extent.

59.—How many characters of sleep are there?

A.—There are two: what has been quite erroneously called natural sleep, and hypnosis. It must be remembered, however, that hypnosis is natural sleep, induced by specific suggestion, while what has been called natural sleep, is only a phase of sleep superinduced by involitional suggestion.

60.—What are the two definite and specific ways of producing hypnosis?

A.—One: By extraneous specific suggestion. Two: By specific auto-suggestion. Of course, it must be remarked that these only refer to the ways in which the suggestion begins, for in the final analysis of the operation, both phases become auto-suggestion, for so soon as the individual adopts the extraneous suggestion he makes it an auto-suggestion by having adopted it.

61.—When can hypnosis be accomplished?

A.—Only when the subject is willing to be hypnotized. And he must be willing, as it were, all through, for he may seem to be willing outwardly, but still deep in his consciousness not have consented or to be afraid, or may have formerly instructed his soul not to permit him to be hypnotized; in such a condition hypnosis is impossible.

62.—What are some of the erroneous conceptions as to hypnotism?

A.—It is supposed that a hypnotist is a peculiar person with mysterious powers. This is not true. It is only necessary that he be able to concentrate upon a given thought and hold that thought positively in unbroken continuity. It is also supposed that a hypnotist must be a very strong willed person, and must operate upon a person of weak will. This is completely erroneous. Will plays very little part in securing hypnosis. The operator must be able to hold a thought positively in continuity. The subject must hold the same thought passively in continuity. No one can be hypnotized against his fixed desire, nor be made to divulge a secret which he has instructed his soul to keep, nor under hypnosis be made to do anything against his fixed principle. It is also supposed that being hypnotized weakens the will and destroys the mind. Nothing could be further from the truth. Under careful administration, hypnosis strengthens mind, memory, and will power.

63.—Is hypnosis of value?

A.—Yes. By means of hypnosis adverse habits may be overcome; memory may be increased; inspiration to accomplish things worth while may be instilled; subjects that have been distasteful to persons may be made agreeable, even much desired; morbid and distressing fear can be banished from the mind; bad habits broken; and many phases of pathology removed.

64.—What is the sane thought respecting the person and the soul of the person?

A.—It consists in the recognition of the specific and direct harmony of relation between these two phases of being, accepting the soul as the source of power and intelligence, therefore as the constructing agent, and matter as the responding agent. This conception is the golden mean that lies between the extreme materialist upon the one hand, and the extreme psychist on the other, and completely unites and harmonizes all of the adverse and conflicting phases.

65.—Why must we begin with minding (mind) in the investigation of psychic things?

A.—Simply because our recognition of all things begins with the minding process. Without mind we would know nothing. Without mind there would be no medium through which knowledge could be obtained. What we know of the universe in any of its aspects we have learned through the minding process. And when the thought is confined to psychic things, our investigation of these phenomena must be accomplished wholly through the physical with minding as the specific agent. In order that this may be accomplished the student must have a very accurate knowledge of the brain and nerve system, and know how mind is produced, and how it functions, for upon an accurate knowledge of how mind is produced and the exact assessment of its quality, depends the acquisition of definite information.

66.—What is knowledge?

A.—In its incipient aspect, knowledge is only that which we believe to be true by the very best tests that we can make of information that is transmitted to us

through our intelligence department. After we have established a prime truth by this process, the acquisition of further truth is accomplished by paralleling the new conception with the old, and if the new conception is consistent in all parts with the old, we accept it as being true. Any student can see that our knowledge rises no higher than our faith in the medium of transmission of intelligence to us, and our faith in the substance thus transmitted.

67.—What are the two ways of acquiring knowledge?

A.—One is by transmission of purported fact to us from others by means of written and spoken words, signs, tokens, etc. The other means of transmission of knowledge is from the soul to the mind—the process which has been called deduction—intuition, and this is much the surer and safer means. The first of these ways is purely dogmatic. The second is deductive.

68.—What is included in the dogmatic method?

A.—Largely what we believe as to our origin, our religion, our scientific conceptions, our knowledge of the social conditions and history, and all phases of government, law and so on.

69.—What is included in the intuitive-deductive method of receiving knowledge?

A.—By that method we go each time to the source of universal truth, so far as it appertains to the material world, and to the source of complete impression and retention, for all of the facts which we would get, for it must be remembered that the soul receives the substance of all information transmitted to it through the five

senses, either singly or in combination, and has this always, in connection with the substance transmitted from the source of universal truth, so that the individual who relies upon this character of information and makes himself sufficiently passive to receive and translate this character of influx of truth, constantly obtains the highest and best phase of knowledge possible to human beings.

70.—What is the caution that must be observed as to intuition?

A.—When we go to the soul source for information, we must go without any desire except to have exact truth revealed, for the mind acts upon the soul as a commandant, and if we go to the soul for knowledge, with a desire for a particular kind of transmission, that will be the character of transmission we will receive. All desire, therefore, must be laid aside by the one who would approach the soul for truth, except solely the desire for exact knowledge, undisturbed and untrammeled by any thought as to what effect that truth might have upon the seeker for wisdom.

71.—When is intuition—deduction—possible?

A.—Only during concentration in passivity. In other words, the individual must desire knowledge upon a specific subject and must concentrate upon that subject, but in doing so he must become completely passive, and therefore must be willing to accept anything that comes, for if there is any desire for anything aside from truth, or any particular character of substance, there will not be passivity.

72.—What preparation is necessary to receive intuition?

A.—Only that of complete passivity, with the same character of concentration. We see this beautifully illustrated in the ordinary baby about eight months of age. There is complete passivity, and when the attention is attracted, there is complete passivity with concentration. And when we stop to think how fast the baby is learning at this period, we realize the value of this means of information.

73.—Are intuitions—deductions—always true?

A.—Yes. It would not be possible for them to be otherwise. But it is of the greatest importance that the student shall make certain that he is in the correct attitude for intuition—deduction. That is, that he is completely passive, and consecrated to the desire for truth regardless of the effect it might have upon him.

74.—What is the caution test?

A.—When the individual has sought for intuition—deduction—and has received impression, if there is any doubt whatever in his mind as to its being true, he may rely upon the fact that it is not deduction, and that he has not been in the attitude to accomplish intuition—deduction.

75.—What is our only channel for receipt of universal truth?

A.—It is the soul, and through and by means of intuition—deduction. It should be observed in passing that as to this means of obtaining information the student should be very careful. He should approach this means

of obtaining knowledge with the most serious and earnest desire, and never in any other attitude.

76.—What do we mean by memory and what do we mean by impression?

A.—Memory is to mind exactly what impression is to the soul. It must be admitted that these are arbitrary distinctions, but they are necessary in order that we may understand each other in discussing this subject.

77.—Upon the receipt of intuition—deduction—what is our most important duty?

A.—To expend the very best of our intelligence in an effort to translate the substance of the transmission and make its proper application to other things that we know, to parallel it with all of the fundamental facts that we possess, and thus come to fully understand, not only its import, but its universal application.

78.—What is the rational attitude?

A.—The rational attitude in viewing all subjects, whether conceived to be psychologic or otherwise, is that mind is our first, nearest and best friend, and is the agent that must be used for all investigation; that it must stand as sentinel to the soul for the purpose of seeing that nothing but truth is transmitted from this plane, and that the substance of truth that comes from the soul, receives proper translation.

79.—What is the most prominent thing in all history?

A.—It is what has formerly been called "healing," and what is still called healing in all branches of therapy, that which is conceived in Chiropractic, to be restoration or reproduction of anatomic relationship in order that

physiologic conduct may take place. Even that part of history that is found in the Bible, and in the bibles of the world, places "healing" as one of the most prominent subjects discussed.

80.—What is the error in the use of the word healing?

A.—It is that in a normally constructed body, living according to the laws of its being—the conception of healing is an impossibility, and when such a body is distorted it is not "healing" that is required, but reconstruction, which can only be accomplished through the process of restoring relationship. Physicians do not and cannot heal. Doctors may aid in restoring relationship, in order that the physiologic processes may reconstruct the body back to what it originally was, but they can effect no healing.

81.—What relation have the so-called systems of healing sustained to each other?

A.—They have all been based upon the proposition of faith: "faith and works." This includes Mohammedanism and Christianity; the religion of the savages of darkest Africa and the practitioners of medicine; the followers of Confucius, Divine healers, Christian Scientists, and the multitude of others too numerous for mention.

82.—As to the "healing" aspects of all religions, what may be said of the truth?

A.—If there was belief in the tenets of the religion as respected the subject of healing, followed by works in conformity therewith, restorations occurred regardless of whether the religion had any truth in it or not. We

find the same percent of cures among the "medicine men" of the savages, the "healers" of the Mohammedans, "Divine healers," "Christian Scientists," and our own "Oriental Christian" religion; and we find no higher percent of restorations among the "practitioners of medicine." In all these phases of therapy, faith followed by works, believing that the results would come has produced substantially all of the efficacious results that have occurred.

83.—What is the basis of value in the application of suggestion to so-called healing?

A.—It is the fact that the individual to whom the suggestion is given believes in the suggestion as a truth, and acts upon it as though it were truth, and in thus acting receives the benefit that was promised as a part of such suggestion. If a person did not believe in suggestion, or did not believe that the thing suggested could be accomplished, the suggestion would not have the desired influence over him.

84.—Is suggestion the basis of all therapeutic, so-called, systems of healing?

A.—It certainly is. All of the quasi-religions of the world have had as a foundation for their systems of healing, a series of suggestions the substance of which must be adopted by the individual and acted upon in order that the benefits might follow. Those who bathed in the pool of Siloam were not healed because it was that pool, for the same pool still lies there in its rocky walls, and bubbles over the edge, as it did in ancient times, but the restorations occurred because of faith and obedience;

that is to say, compliance in faith with the suggestion.

85.—Is there curative property in medicine?

A.—Using the word "cure" in the therapeutic sense, as meaning reconstruction, it can be plainly seen that medicine has no power to reconstruct a distorted and depleted body or part. Food, that is to say, substance the body may use in its economy, may tend to its reconstruction. If, therefore, a medicine is also a food, to that extent it might aid in the recovery of the sick person. Medicines as they are known to-day have no food value. Therefore, they are not curative. A medicine that causes disintegration and depuration, may prepare the way for reconstructive processes of the body to accomplish restoration; but this is in no sense an admission that medicine possesses curative or constructive values or properties.

86.—How is it possible to remove faith in an error which is adversely affecting an organism?

A.—The only means is to reach the very mental phase in which the memory of the adverse suggestion is retained, and obliterate it by a flood of truth directly opposed to it, until when the individual reverts to that particular phase the first and paramount thing that comes to his attention is the truth instead of the error. Sometimes it is only possible to do this through hypnosis, by post-suggestion. Generally, it may be done by milder or less exacting means of suggestion.

87.—What is so-called Psycho-Therapy?

A.—It consists in a multiplicity of methods to accomplish the results suggested in the last answer. That is

to say, the various means of causing individuals to recede from adverse characteristic auto-suggestions that are destructive in their nature, and to accept those that are constructive. Very much has been accomplished through these means. However, Psycho-Therapy is a misnomer. If we would do away with the meaningless word "Therapy," and speak of Psycho-restoration or Psycho-restoro-relationship, we would be within the truth.

88.—What is the limitation of restoration through and by means of suggestion?

A.—The limitation of the power of suggestion to restore is reached when the brain and nerve system is in such condition that the vibrations from a suggestion cannot be transmitted through the brain to the soul in such manner as to be transmitted from the soul to the body in each and all of its parts.

When the soul cannot be reached by suggestion, or being reached, cannot transmit the influence of the suggestion to a given part of the body—the limit of restoration by suggestion has been reached.

89.—What error respecting this have all psychologists made?

A.—They have said that the subjective, subliminal, subconscious, or some other kind of a "sub" mind, meaning thereby the soul, is always amenable to control by suggestion, when the fact is that the soul is only amenable to control by suggestion when the machinery of intelligence of the organism, the brain and nerve system, is in such condition that it can, not only receive and

transmit suggestion to the soul, but when the machinery of transmission is in such condition that the value of the suggestion can be transmitted, and put into operation in any and every part of the body.

90.—When is so-called healing by suggestion possible?

A.—When the suggestion can be conveyed to the soul, and the proper influence transmitted from the soul to any and every part of the body.

91.—What material agencies must convey the influence of a suggestion?

A.—The brain and nerve system. A suggestion must be transmitted through mind areas of the brain, it must reach the soul, and must be re-transmitted through mind areas of the brain and then through the nerve system to the place needed.

92.—What can obstruct the transmission of the influence of suggestion?

A.—It must be well understood that force cannot be stopped. When we say that nerve force is occluded or interfered with, we do not mean that it is stopped, but that its mode of application to matter is disturbed to such extent that the physiologic result is not obtained, and this interference may become so grave as to abort animation. Any change, therefore, in the relationship of matter such as to interfere with nerve stimulus, obstructs the influence of suggestion, when it must be transmitted through the area where such situation exists.

93.—What effect must follow the impediment of the substance of a suggestion?

A.—If the influence of the suggestion would tend to

increase or perfect physiologic conduct, then its occlusion would be to cause the process to tend toward the pathologic, or perhaps become such. But if the influence of the suggestion was adverse, then its occlusion or impediment would be beneficial to the part. Where occlusion is sufficiently pronounced, the force, called nerve stimulus, may escape from its channels, in which it ceases to be nerve force and becomes a disintegratory or destructive phase of force.

94.—What is the situation called that produces occlusion?

A.—It is distortion or disrelation. The limit of the value of suggestion in overcoming distortion has been reached when a suggestion transmitted from mind to soul cannot be returned to a specific part of the body. Then that part of the body is beyond assistance by the influence of suggestion. This may be illustrated by the situation of a paralyzed member.

95.—How may occlusion and the interruption of the influence of suggestion be removed?

A.—So long as the influence of positive suggestion can be delivered to the part of the organism involved, it may be removed by suggestion; but when the distortion is sufficiently grave that the influence of suggestion cannot be delivered to the part, it can then only be removed by securing relation of the part by the application of extraneous, assistive means.

96.—What is the science that furnishes the system to remove occlusion of the influence of suggestion called?

A.—In general, it is called the science of Chiropractic,

the actual science, however, being the science of Relatolity, which includes the *art of relating,* which is the intelligent application of well-directed extraneous force to the gradual correction of relationship of distorted parts until complete relation is restored, and therefore all function returned to the normal.

BIOLOGY

1.—What is biology, considered from the therapeutic standpoint?

A.—The concensus of opinion gives it as being the discussion of living organisms; or, the science which treats of living organisms.

2.—What is the science of biology?

A.—It is that department or branch of discussion which deals with the phenomena incident to animation, or, the action of matter under the application of intelligence, life and force.

3.—Why is it not sufficient to say that biology is a discussion of living things?

A.—Because it is perfectly clear that matter is never under any circumstance alive, but that life acts through and upon matter, causing the conduct that we call animation, which is in no sense life, but is only the expression produced by the force of life.

4.—What shall we say then of all of the things that we have conceived to be alive, such as man, trees, animals, etc.?

A.—The proper and truthful conception is that these things are not alive, but that life is immanent in all such structures, but not inherent in them, that intelligent-life-force acting upon the matter involved causes all of the conduct which has heretofore erroneously been conceived to be life, or living.

5.—What is the discussion of biology, itself, as a matter of fact?

A.—It is not a discussion of life in itself, but it is a discussion of the constructive influence which brings together inanimate particles of matter and establishes their relationship in such way as to construct and maintain all of the parts that enter into animate things, which have been erroneously conceived to be living things.

6.—What phase of life is it possible for us to know while occupying this material being?

A.—Only such phases as we may become cognizant of by observing the manifestations of life in its action through and upon matter in the various animate forms about us.

7.—What fact, concerning life, is most clearly demonstrated to us by all phenomena?

A.—It is perfectly demonstrated to us that life is not an expression or emanation from matter, and that matter is never in any sense alive, but is only animated by life, acting through and upon it, which is proved by the fact of dissolution, and the further fact that no one is able to conceive dissolution in any other way than that life has simply left the matter it formerly animated.

8.—In the department of Psychology what have we learned as to life?

A.—We have learned that the words life and soul, or the conceptions for which these words stand, might easily be conceived to be interchangeable; in other words, we have no way of clearly defining any difference between what we have called soul and what we have called life.

9.—In what specific sense do we most completely grasp the substance of the last answer?

A.—We recognize life as a causative factor in the construction of a human organism, and this is also the office which we conceive that the soul fills in the same way.

10.—What important explanation would we avoid by discarding the use of the word soul and thinking only of life as the causative factor?

A.—We would avoid the necessity of explaining, when it comes to animate things that are not of the animal kingdom, and what we choose to call the lower animals, that the life of such things takes the place of what we call soul in the human being; for it is perfectly clear that all animate things are animated by intelligence-life-force, acting upon and through them; and a great many do not find themselves able to accept the proposition that trees and rabbits, for instance, have souls.

11.—What other difficulties beset the thought that the soul causes animation?

A.—We find it necessary to ascribe to the soul certain attributes which do not seem to be necessary to us in the abstract thought of life. These are, potential omnipotence, omniscience, omnipresence and constructive love. But a very little thought makes it clearly appear that life in any view of it, that we may take, possesses these potential qualities.

12.—Shall we continue to use the word soul?

A.—Yes. For the purpose of saving confusion, for the soul of man unquestionably causes the formation of his material being; from the very incipiency of formation,

it brings together the first particles—the infinitesimal, inanimate portions of matter and weaves them into the granular, cellular, tissue structures necessary to the full stature of the organism, and causes all conduct that takes place; and it must be added that from all this it is impossible to assign a conception of life aside from the soul.

13.—What should be said in this connection to calm the hastily aroused thoughts of those not familiar with this process of thinking with respect to life?

A.—Why! that it is not necessary that plants and so-called lower animals have souls according to our conception of the soul as applied to human beings; but that they have life, and that the life of each plant and animal is to it the same as the soul of a human being is to him.

14.—What response should be given to those who quibble about this phase of the question under discussion?

A.—Just this: That it cannot be declared that plants and "lower" animals have souls, because so far, it is impossible for man to communicate, to establish rapport in other words with such things, and therefore, he is not able to say with certainty that plants and so-called lower animals have souls; but that he does know that they are animate, and that life force causes intelligent action to take place in them, from which he cannot abstract the idea of intelligence and the four attributes of the soul.

15.—What is the conclusion of the whole matter in this particular phase of the subject?

A.—It is that life, and intelligence, which is a part of

life, causes and has caused every animate structure that has ever, or ever will, exist.

16.—In a discussion of biology, to what is primary thought addressed?

A.—It is first addressed to the causation of structural formation of every animate thing.

17.—And in a discussion of biology, what is the secondary consideration for discussion?

A.—The secondary discussion is addressed to the conduct of every structure formed.

18.—In what two grand divisions must biology be considered?

A.—First, under what has been called the "animal kingdom," and second, what has been called the "vegetable kingdom." It should be remarked in passing that this language and thought is much simplified by saying that it is to be considered under animal animation, and vegetable animation.

19.—To what department is that respecting animal animation assigned?

A.—It is assigned to what has been called zoölogy, or a discussion of animate things, which have the power of locomotion, and are therefore classified as belonging to the animal kingdom.

20.—To what department is the second grand division referred?

A.—It is assigned to that classification of discussion called botany, or a discussion of those animate structures which are not animal, and are attached to the earth, or at least do not have the power of locomotion.

21.—What scope has been assigned in the department of biology?

A.—Authors have declared that biology takes us from the ameba to man.

22.—What criticism upon this answer should we make?

A.—Simply this: That to start with the ameba is to really start at the end instead of the beginning, for the ameba is a structure—is an animal; therefore, we should begin with the first particle that enters into the beginning of a structure, which is to become an animate and systemic body.

23.—In an attempt to study animals what is the first phase that presents itself?

A.—It is a consideration of structure. This has been generally, loosely referred to as anatomy, and is said to consist of a description of the appearance, size, shape, color and density of the parts of an organism.

24.—What is the primary and incipient department of anatomy called?

A.—That part of anatomy which deals with the beginning of structural formations is called histology, and should be conceived as dealing with the particles that form the very incipiency of an organism.

25.—In its broadest sense, of what does anatomy treat?

A.—It treats of the description and analysis of the structural formation of the parts of the animal world.

26.—Of what does botany consist?

A.—It consists of the histology and anatomy of all characters of plant life; that is to say, a description of all members of the vegetable world, and a complete

analysis of each phase of formativeness, and a description of the size, color, shape and density of all the parts of plants.

27.—What is the next most important consideration in biology?

A.—It is a discussion of the conduct of all the infinitesimal particles involved in the construction of plants or animals; or a discussion of the whole plant or animal in its operation.

28.—What is this discussion called when the subject is confined to animals?

A.—It is called the physiology of animal animation. The more common conception restricts this discussion to the conduct of the human organism.

29.—Is there any good reason for not calling the same character of conduct within the members of the vegetable world physiology?

A.—No. There is not; for such conduct is as truly physiology as is the conduct of the parts of an animal, or the whole organism of an animal.

30.—In connection with the study of biology what two other classifications are usually considered?

A.—They are etiology and distribution.

31.—What is etiology?

A.—Therapy has declared this to be the science of causes, or a discussion of causation. This subject is completely comprehended in its multiplicity of details in Psychology, Physiology, Pathology and Symptomology. In medical literature the word is usually confined to the causation of disease. As a department of biology it will

be understood that it is more particularly addressed to physiology.

32.—What is physiology?

A.—It is the scientific discussion of the conduct of the various parts of an animate body or the whole body considered together, in its response to life force, soul force, or nerve stimulus, in its animating and constructive operations. The student is referred for a detailed supplement to this answer to the physiologic department of Psycho-Bio-Physiology by the author of this study.

33.—What is that department of biology called distribution?

A.—It is the scientific discussion of the various places upon the earth's surface where animation may be maintained, and the character of animation that may be maintained in the different areas discussed.

34.—What is the fundamental fact that underlies all propositions with respect to distribution?

A.—It is that all animation acts as though it had been intended from the beginning that certain phases of animate conduct should be more easily maintained at certain levels, within certain characters of atmosphere, and exposed to certain emanations from the earth.

35.—What is the first law of distribution that the student should definitely understand?

A.—That at or near the surface of our earth all matter, if not sustained by relative substances, would go in a straight line toward the center of the earth.

36.—What has this tendency of all ponderable objects been called?

A.—It has been called gravitation by attraction.

37.—What has been assigned as the reason for gravitation?

A.—It has been declared that the earth exercises an attraction for all ponderable substances at or near its surface. It must be admitted that the words, "Attraction of Gravitation," are without value, and are really meaningless from the standpoint of an explanation. However, they are arbitrary terms used to designate a conduct that seems to take place without exception, and they are therefore of importance to us.

38.—If relative material support or interference is taken away from it, in what direction will a ponderable body be said to go?

A.—It will be said to fall in the vertical direction and by doing so demonstrate the perpendicular.

39.—What would the transverse or transection, at right angles, of such a line be called, if the same occurred at the surface of the earth, or parallel with it?

A.—It would establish what is called the horizon, and any line that transects the perpendicular at right angles is called a horizontal line, because it is presumed to be parallel with the horizon.

40.—Does this proposition introduce a novelty?

A.—Yes, for the horizon of our earth is a curved line, while the novelty injected presents the horizon as a straight line. This novelty is introduced for the purpose of exactness of measurements.

41.—What is the second law of distribution?

A.—All matter is said to have ponderability or weight,

except ether, and this only means that all such matter is within the law of gravitation.

42.—Where is the standard of ponderability or weight fixed for the purpose of comparisons?

A.—At what is generally called "ocean level."

43.—What is the general law that applies to matter as it is raised above "ocean level"?

A.—Matter is said to lose in ponderability as it is raised above ocean level, but this loss is not on account of any organic or chemical change, but from other relative facts.

44.—What change takes place in matter as it is raised above ocean level?

A.—It lessens in ponderability, because its relative pressures are reduced, and it becomes more porous or distended as to its particles.

45.—What is the third law of distribution?

A.—It is that all particles of matter, whether considered abstractly or as parts of animate organisms, nevertheless tend toward the center of the earth, and if not opposed by any force to disturb the operation of the law, they stick together in ratio with their ponderability, and with pressure universally applied to them, thus expressing a phenomenon that is called cohesion.

46.—Considered from the standpoint of the law just given, what effect will it have upon it to remove an organism from the surface of the earth?

A.—Its porosity will be increased and its cohesion decreased in ratio with the distance from the surface of the earth, to the point where resistance is overcome,

when a disintegratory process will set in, overcoming cohesion, hence destroying porosity.

47.—What effect will it have upon porosity and cohesion within a body in going from the surface of the earth toward its center?

A.—Other things being equal, cohesion will be increased and porosity decreased in ratio with the distance from the surface of the earth, to the point where resistance is overcome, at which a disintegratory process takes place aborting both cohesion and porosity necessary to animation.

48.—At the present what is the scope of demonstration of the last two propositions?

A.—It has all been within the scope of some seven or eight miles. And within that scope the laws as stated have operated, which is a sufficient demonstration for the purposes of the work now in hand.

49.—What valuable facts are furnished by the laws of distribution already stated?

A.—It furnishes the fundamental for consideration of altitudes, as part of the subject of health, it being true that some organisms function better in higher altitudes, while others function better at low altitudes, or at ocean level.

50.—What are the facts of sustaining animation upon the earth?

A.—That there are large portions of the earth's surface upon which vegetable animation cannot be maintained, and where animal animation cannot exist for long; and it is also true that all phases of animation are

more abundant and in greater profusion at or near ocean level, and can only exist within a few miles in either direction from ocean level, and only then if the temperature is propitious.

51.—Is there any means of demonstrating the value of these laws from the surface of the earth toward its center?

A.—Only in the most meager instances, such for instance as Death Valley, certain places in the Sahara Desert, the Valley of the old Saltan Sea, etc., and in coal and other sorts of mines. In these depressions, where there is water in profusion there is the same lush and rank vegetation for a short distance below ocean level as immediately above ocean level, but, of course, under the surface of the earth the absence of the direct sun's rays prevents any demonstration other than that of animal maintenance, and some negligible rare vegetation, which is not successful, at any very great distance or persisted in for any considerable length of time.

52.—Is there any other proposition that must be taken into consideration in connection with altitudes, porosity and cohesion?

A.—Yes. The chemistry of the atmosphere must always be taken into consideration, at all points of distribution under consideration.

53.—What is the fourth law of distribution that must be carefully considered?

A.—It is that our earth is surrounded by a gaseous vapor called atmosphere, which responds as all other matter to the attraction of gravitation, and tends to go

toward the center of the earth equally at all points of the earth's surface, at what is called ocean level.

54.—What is the measure of gravitation of the atmosphere at ocean level conceived to be?

A.—It is fifteen pounds to the square inch of supporting surface.

55.—If there is nothing disturbing the law just stated in the form of chemical reactions or otherwise, where is the atmosphere densest?

A.—From the standpoint mentioned, the atmosphere has greatest density at ocean level, and lessens in the ratio with the distance vertically away from that level, and increases in ratio with the distance from ocean level going toward the center of the earth.

56.—In view of the facts just stated, what is true of the cohesion of the particles of an organism?

A.—It is the remarkable fact that cohesion of the particles of an organism at ocean level is increased by substantially fifteen pounds to the square inch of supporting surface, and this increased cohesion would be lessened in ratio with the distance in a direction vertically away from ocean level.

57.—What remarkable and valuable fact is revealed by the laws just stated?

A.—That in a great ascent from ocean level, the divergent lines of gravitation would serve finally to completely overcome the cohesion of the particles of an organism so as to render animation impossible, and at the same time to lessen atmospheric pressure by diverg-

ing its particles so as to render a sufficient respiration of it impossible.

58.—What phase of pathology does the operation of the laws just stated present in human organisms at elevations from ocean level or descents from it?

A.—It presents hemorrhage through mucous membranes of catarrhal persons, or those whose mucous membranes are non-resistant; prostration of those whose respiratory organs are non-resistant, and the swooning of those whose brain tissues are so far from positive as to be chronically tending to the negative phase. In other words, the operation of the laws stated discloses weakness of cohesion if it exists in any part of the organism.

59.—What physiologic law does the facts just stated present to us?

A.—That it is hazardous for any person gravely abnormal as to any of the organs of vital function to attempt high altitudes, and that it would be equally hazardous for such persons to attempt great depths within the earth, for in that direction resistance is overcome in precisely the opposite manner; that is, by an increased convergence of the particles, particularly of non-resistant structures.

60.—What is the fifth law of distribution which we should learn?

A.—That cohesion between the molecules of like substances, and adhesion between the molecules of substances that are not alike, exists because the molecular surfaces of such substances are fitted to each other, and

because of that fact, cease to vibrate individually and vibrate together or in a unific manner, thus establishing a harmony of conduct which permits gravity and atmospheric pressure to aid in holding them together.

61.—Do we have illustration of this law in ordinary substances?

A.—Yes. The surfaces of plate glass cohere when firmly pressed together sufficiently to sustain the weight of the glass. Sheets of paper rubbed together until they are warmed into relationship exemplify the same thing. Putty, soft clay, wax, and the welding of two pieces of metal are illustrations of the same thing. The facility with which mud attaches itself to any other substance is perhaps the best illustration of adhesion.

62.—What awe-inspiring fact in regard to the human organism is presented by the law just given?

A.—It is that the construction of the molecule in human structure out of inanimate particles, and their cohesion together in such way as to express animation is being accomplished continuously as are also the adhesion of liquid parts, which operations are constantly keeping pace with molecular disintegration, in such manner as to not only, in the first place, construct the organism, but afterward to maintain it.

63.—By what operation is the cohesion and adhesion necessary to maintain an animate organism constantly carried on?

A.—By the application of the force of life, or what is ordinarily called nerve stimulus, and what might just as easily be called soul force, acting through and upon the

molecules, keeping them constantly in movement, and pressed sufficiently together to be within the scope necessary for cohesion or adhesion.

64.—What are some of the functional names given to the result of the phase of force just described upon matter?

A.—The result of cohesion and adhesion is referred to functionally as tenacity, resistance or virility.

65.—What ultimate law with respect to cohesion and adhesion has been revealed by the deductive process used?

A.—It is that since cohesion and adhesion sufficient to produce an animate organism, develop it to maturity, and maintain it, is caused by the action of life force or nerve stimulus upon the matter involved; that pathologic disintegration of any part, or finally dissolution, as it is called, is but the result of the withdrawal, or occlusion of nerve force from the matter involved. Death, as it is ordinarily spoken of, is but the result of the failure of the application of life force or stimulus through its specific and organized channels.

66.—What is the sixth law of distribution that it is necessary to understand?

A.—We have so far spoken of cohesion and adhesion. It must be understood that adhesion is spoken of as pertaining to the liquids out of which the organism is being constantly formed, the particles of which must be assumed to be different in their chemical formulæ, hence their sticking together is called adhesion. It must also be conceived that in the sense now under discussion the

organic parts of the body are composed of solids, and that the solids of a given area must be alike, and therefore the sticking together of such molecules is called cohesion. Adhesion then is the process conceived to be taking place during the entire colloid preparation for animation, and that in the homogeneousness produced by final elaboration, the transmutations are made, by which ultimate cohesion is accomplished; the entire process being called assimilation.

67.—What colloidal fact is here succinctly put to the student?

A.—It is that the molecules of the colloid out of which the animate body is to be constructed, cling to each other by the law of adhesion, and that the force of adhesion must be overcome, by the force of life or nerve stimulus, in order that such molecular impact may be produced, as to put into operation the law of cohesion, and that in this transaction, life force, operating in an unmolested manner, continues to vibrate the cohered molecules in accordance with the law of each particular organism.

68.—What is morphology?

A.—Morphology is a discussion of the structure of animate substances, and comprehends every phase of form, shape, color and density that is presented in animal and vegetable animation.

69.—In what characters are the substances that enter into the composition of vegetables and animals now conceived to be presented?

A.—In four forms or phases—gas, liquid, colloid and solid.

70.—In view of the fact just stated and the further elucidations necessary, what is gas?

A.—It is an invisible fluid that has neither definite form nor definite volume. The reason gas is said not to have definite form is because its molecules change their relation so readily, and for the same reason gas cannot be conceived to have definite volume.

71.—In the same sense, what is a liquid?

A.—A liquid is a compound of gases, sufficiently stable to be said to have definite volume, but to change its form with very slight influence. Therefore, it is said to have indefinite form but definite volume.

72.—What is said to be generally the form of liquid parts?

A.—Liquids are said to be composed of globular elements that roll in relation with each other with great readiness, and to readily respond to the application of any phase of force. Liquids have such regularity of volume as to be easily capable of being measured and weighed.

73.—What law is disclosed, by the facts stated thus far, concerning liquids?

A.—It is that because of the readiness with which the globules of a liquid change their relation and respond to the impulsion of force, liquid is the medium for the admixture of all other forms of matter.

74.—Why is the law just stated of very far reaching importance to the student of Chiropractic?

A.—It is because he must understand that every phase of matter that he will ever handle keeps its present con-

sistence because of the admixture of certain elemental substances with liquid.

75.—What is a colloid?

A.—It is a substance between liquid and solid that partakes of the characteristics of a jelly, because there is suspended in the liquid certain attenuated solids.

76.—What is the law by which colloids are maintained?

A.—It is that the molecules of solids immersed in the liquid have been reduced to such size that their capillary attraction is greater than their ponderability, so that they respond to capillary attraction, instead of gravity, and therefore, remain suspended in the liquid.

77.—From the standpoint of tissue construction, what place do colloids occupy?

A.—They are the link of transmutation between liquids upon the one hand, and solids upon the other, and are absolutely essential to the production of solids. In other words, a solid could not be produced without severing the inanimate particles into such infinitesimal size as to be held in suspension in the liquids by means of which they are carried to the place of use by the impulsion of nerve stimulus.

78.—What is the importance of the student fully understanding the operation of colloids?

A.—He should realize that his entire knowledge of tissue construction, growth, reproduction, physiologic maintenance, and finally of pathology, symptomology, and dissolution, must depend upon, and be in ratio with, his understanding of colloids.

79.—What is a solid?

A.—It is a substance or part of matter which has definite size, color, density and shape, which it constantly tends to maintain, with specific resistance, and which always requires a specific amount of force, definitely applied, to overcome.

80.—What is the chief difference between a solid and a colloid?

A.—It is that in the solid, cohesion is sufficiently close that tenacity tends to sustain a given color, shape, density and size; while in the colloid, shape and density tend to change with great ease and rapidity.

81.—What physiologic office is made possible and greatly facilitated by colloids?

A.—The office of depuration and elimination, which could not be performed except through the medium of colloids.

82.—Define a solid.

A.—A solid is said to be a substance or part of matter which is sufficiently dense, that is, the molecules of which are sufficiently near in their relation, that it presents a tenacity against change of density, size, color and shape; or tends to maintain its density, size, color and shape with specific resistance, which cannot be changed except when that resistance is overcome.

83.—Is there an essential morphologic or structural difference between the vegetable and the animal world?

A.—No. The essentials of plants and animals, so far as their material aspects are concerned, are practically identical.

84.—What is the proof of the answer last made?

A.—It is: (a) that plants have structure not essentially different from that of animals; (b) The basis of plant growth is a cell, just as it is in animal structure; (c) Members of the vegetable kingdom grow and reach maturity; (d) They have systems of nutrition; (e) They have systems of assimilation; (f) They have systems of depuration and elimination; (g) Members of the vegetable kingdom have well-defined systems of reproduction or procreation.

85.—In view of the last answer, what finally constitutes the paramount difference between the vegetable and animal?

A.—It is that animals have locomotion while plants do not; and we think that plants have not sensation; yet they respond to influences precisely as animals do that we know have sensation. And so that hardly constitutes a difference.

86.—Is there a difference between the way plants and animals grow, in the last analysis?

A.—No. Plants grow by reproduction and by a gestative procedure, and so do animals. The student is encouraged to read widely, using this quiz as his outline upon this very important theme.

HISTOLOGY

1.—What is histology?

A.—It is the primary phase of anatomy, and is the study of the structure of the infinitesimal particles that go to make up cells, segments, organs, etc. It is sometimes called microscopic anatomy.

2.—In the present stage of advancement, what has been considered under histology?

A.—Only those infinitesimal parts of matter which the microscope will disclose with sufficient accuracy for description.

3.—Is such a description of reliable value?

A.—No. Except when it deals with actual structures that could not be seen with the naked eye, and which therefore lead to correct deduction.

4.—What is the histologic ideal toward which we should strive?

A.—It is to attain to the place where a complete examination of the components of structure may be had, with complete description of them and their specific size, shape, color, and density in the construction of what we have called tissues.

5.—Of what would the unit of structure, from a deductive standpoint, consist?

A.—It would consist of the smallest part of animate matter that could exist in such way as to be an integral part of a cell, segment or organ.

6.—What novelty is introduced at this juncture, to aid the student in histologic investigation?

A.—It is the novelty called the "animal cell," and for convenience, at the present time, the animal cell is called the unit of structure, although it must be readily seen that it is not.

7.—What is the actual deductive fact with regard to the animal cell?

A.—It is that, of course, the animal cell is composed of integral parts, which are just as distinctive as such, as the cell is distinctive in its relation to other cells or structures.

8.—What is the word that we sometimes find as being indicative of the smallest histologic particle?

A.—It is the "Ion."

9.—What is the objection to the word?

A.—It is a word that applies distinctly to electricity, and it can hardly be conceived as being properly applied to any infinitesimal part of matter. I would prefer the word particle, as being more specific and applicable.

10.—What enumeration gives us some idea of the scope of histology?

A.—A definite consideration of all phases of animal matter, beginning with the connective tissue of origin and going thence to membranes, cartilages, bone, muscle, ligament, aponeuroses, glandular substances, and the brain and nerves.

11.—What is the fact as to the original formation of the primary particle of an animate body?

A.—It is that the first particle must be formed by the rearrangement of matter under intelligent force, to constitute a new organism, and that thereafter other cell particles must be originally constructed to form cells, segments, organs, and parts in conformity with the original particle.

12.—How long does the process of original construction of tissue particles continue?

A.—It continues so long as there is the reproduction of cell parts; or, so long as assimilation continues to be accomplished.

13.—What remarkable phase in this connection is brought definitely to attention?

A.—It is that so long as growth continues there is not only original construction for repair, but that there continues to be original construction of what has been called new cell particles and cells, and therefore, of course, new cell particles, to the production of incidental segments.

14.—How long must this character of tissue construction maintain?

A.—Not only so long as assimilation for the purpose of growth or repair is necessary, but so long as tissue is lost by wounds and injuries and must, therefore, be specifically repaired.

15.—What should be said as to the histology of the brain and nerve system?

A.—That the incipient particles with which to form brain must be in the impregnated ovum, and that the

incipient brain is the first structure formed, which finally results in the fully developed brain and nerve system.

16.—Why must this be conceived to be true?

A.—It must be conceived to be true because, ever after in the history of the organism, life force or stimulus to construct all grosser tissues is transmitted through the brain and nerves.

17.—What does the novelty—the animal cell—consist of?

A.—The animal cell is said to consist of the soft, gelatinous, granular protoplasm, inclosed within a limiting membrane, and containing within itself a vesicle, occupied by a colloid, inside of which there are one or more spots of different material. It differs much in different animals, and in the same animal in different characters of tissue.

18.—In the human organism, what are said to be the two essentials of a cell?

A.—1. The protoplasm, which is said to be the soft, gelatinous, granular material. 2. The nucleus, which is the vesicle contained within the protoplasm, and which contains the smaller body or bodies within it, which if there is but one is called the nucleolus, and if there are more than one, the nucleoli.

19.—Do cells exist without the nucleolus?

A.—Cells are classified as being nucleated and non-nucleated. However, since many cells are microscopic, this may or may not be true; but it is true that in non-reproductive cells there is no need for a nucleolus.

20.—What is protoplasm?

A.—It is a proteid, which cannot be distinguished from albumen. It is, speaking from the standpoint of tissue formation, the incipient form of organized matter.

21.—What is its peculiar characteristic with regard to water?

A.—It is insoluble; that is, it is not dissolved in water; and coagulates at 130 degrees Fahrenheit.

22.—What is the pronounced peculiarity of the protoplasmic cell?

A.—It seems when acted upon by life force to possess the power of motion and nutrition.

23.—In the sense stated, what is meant by motion?

A.—It is the quality by which the protoplasmic cell under irritation throws out a process on the opposite side and gradually withdraws itself from the irritant so that its mass occupies a new position.

24.—What other movement has the protoplasmic cell?

A.—It seems to have the capacity, since it does move toward nutritive substances, to bring those substances into itself by means of absorption. The student will observe that this is but a second mode of motion.

25.—What have these two characters of motion been called or designated?

A.—Ameboid movement. It has also been called ciliary or hair-like, vibratory movement.

26.—What is the nucleus?

A.—It is a small vesicle imbedded in the protoplasm, usually of spheroid form, and in size proportionate to the protoplasm, and is regarded as a portion of the

protoplasm of a more refined type set apart for the purposes of reproduction, being of a little different chemical formula than the ordinary protoplasm.

27.—What is the nucleolus?

A.—It is said to be the *germinal spot* within the nucleus, and is the place where it is supposed the reproduction of cells begins.

28.—What are the two processes by which cells are reproduced?

A.—They are called segmentation and gemmation.

29.—What constitutes the difference between these two?

A.—Segmentation is the reproduction of cells by twos, in which the original cell divides in half, each part being a new cell. Gemmation is the process by which many cells bud from an original cell, finally maturing into cells like unto the parent one.

30.—What is the proper conception for the student as to the formation of cells?

A.—It is that all tissue formation begins with the smallest part of matter conceivable, and that these infinitesimal particles are related under life force, and cohered to produce atoms, and then atoms are related and cohered to produce molecules, and that finally molecules are related and cohered to produce cells, and then that cells are related and cohered to produce tissues, segments, organs and parts.

31.—In this constructive process, what must the student conceive constitutes the difference between different characters of tissue?

A.—He must conceive that the different characters of tissue are the result of the different assembling of the infinitesimal particles and a different chemical formula, hence a different degree of refinement in the consistence of all of the different structures produced. He can only know that this is done following a design or plan, which in itself is inscrutable until it is revealed by being produced.

32.—What should the basic substance of all tissue be called?

A.—It should be called connective tissue, and this term applies as completely to the brain and nerves, to glandular structures, muscles, etc., as to any other part of the body.

33.—How are all structures held together?

A.—The brain, the glands, and every other structure, are held together by strips or spicule of membrane, so arranged as to form a net-work or trabeculæ; which is usually referred to as areolar tissue.

34.—What is the arrangement of these structures, and why?

A.—The integral parts of tissue are always arranged so as to provide for easy occupancy within them of nerves and their ganglioform plexuses, arteries, veins, capillaries and lymph vessels, in order that life force shall have unobstructed transmission and that liquids may be easily moved about through the tissues or structures.

35.—What is the paramount or most important function incident to this arrangement of structure?

A.—It is the free transmission and application of nerve stimulus or life force, through the nerves to the entire body; which force moves the liquids to the most infinitesimal parts of animate structure, and away from them, through the channels of depuration and elimination, or back into the central channels of liquid transportation.

36.—What is the arrangement called by which the liquids of the body supply what is called nutriment to tissue?

A.—The winking valves of the capillaries; that is, the little openings between the cells of the single layers of membrane, which compose the capillary walls.

37.—What is the substance called which under nerve force is extruded through the winking valves of the capillaries?

A.—It is *secondary lymph,* and has been called blood plasma.

38.—Does this lymph contain any corpuscles?

A.—No. In health it does not; but it does contain substances necessary for the building or assimilation of new cell particles.

39.—Is the capillary arrangement just indicated, continuous and comprehensive of the entire organism?

A.—Yes. There is no part of animate tissue which is not, in health, thus completely supplied with secondary lymph, which is only so designated because it has passed into and out of the blood.

40.—What character of structure is found upon all eliminative or absorbing surfaces?

A.—It is a character of skin or covering classified as epithelium. It will be seen that these surfaces are the skins or membranes lining all tubes, such as arteries, veins, intestines, air tubes, etc.

41.—Of the epithelium that lines all tubes, what are the two characters?

A.—That which lines tubes that are exposed to the air, such as the alimentary canal, and the respiratory or breathing tubes, is called mucous membrane. That which lines tubes such as the arteries, veins, the abdominal cavity, etc., are called serous membrane.

42.—What is it said epithelium consists of?

A.—It is said to be composed of a basement membrane, which, of course, is composed of small and closely placed cells, upon which there are one or more layers of differentiated cells.

43.—How are the cells of epithelium joined together?

A.—They are joined together by a substance called cellular paste, cement which attaches them by their edges, sides or ends, depending upon their shape.

44.—What are the two characters of epithelium?

A.—1. Simple epithelium; and 2, stratified epithelium.

45.—What is a simple epithelium?

A.—It consists of a single layer of cells upon a basement membrane.

46.—What is stratified epithelium?

A.—It consists of two or more layers of cells upon a basement membrane.

47.—What is it that determines the classifications of stratified epithelium?

A.—The peculiar shape and character of the cells involved. These are classified as tessellated or pavement, columnar, spheroidal or glandular, and ciliated; the pavement cells being flat and attached by their edges, the columnar cells being formed of cylindrical, or rod-shaped structures, which are attached by one end to the basement membrane, and by their sides to each other. Sometimes the free ends of such cells contain little depressions which causes them to then be called goblet or chalice cells.

48.—What is ciliated epithelium?

A.—It is an epithelium which presents as its last layer hair-like cells. It is usually found on the free ends of cells of columnar epithelium. These hair-like cells are constantly in a lashing motion like waving grass.

49.—What is endothelium?

A.—It is the membrane which lines the inner surfaces of closed cavities, such as synovial sacs, the heart, blood and lymph vessels, ventricular surfaces of the brain, and also the vertebral cord. It is just like epithelium only it is upon within, instead of just upon.

50.—Where is ciliated epithelium found?

A.—Ciliated epithelium lines the respiratory tract to the infundibula of the lungs, the middle ear, the Eustachian tubes, Fallopian tubes and upper part of the uterus, the first part of the excretory ducts of the testes, the ventricles of the brain and central canal of the vertebral cord.

EMBRYOLOGY

1.—What is embryology?

A.—It is that subject which treats of the reproduction of animals, beginning with the female and male components of reproduction, and going on to the completed organism.

2.—In the human family, what are these parts called?

A.—The female part is called a matured ovum. The male part is called a spermatozoon. The incipient phase produced by the union of these two is called the zygote, and after further development, the embryo, and finally the fetus.

3.—Is the ovum an animal cell?

A.—Yes. But it is not what is called a common animal cell, it never is and cannot be a component of tissue or structure: this is also true of the spermatozoon.

4.—Where is the ovum produced and matured?

A.—In a little sac called a Graafian follicle in the ovary of the woman.

5.—Where is the spermatozoon produced and matured?

A.—In a cell nest in a tubule of the testis of the man.

6.—By what names are these germinal parts usually designated?

A.—The plural of the word ovum is generally used,

being ova; and also the plural of the word spermatozoon being spermatozoa.

7.—Does an ovum contain the same general departments as an ordinary animal cell?

A.—Yes, apparently, for it has the general protoplasm, inclosed by a limiting membrane, in which there is a small vesicle called the nucleus, in which there is imbedded a nucleolus or nucleoli.

8.—What is the general shape of the spermatozoon?

A.—It is a long, slender, polliwog-shaped structure, with a sharp head-piece, and is constantly in motion in the semen.

9.—What is impregnation?

A.—It is the piercing of the limiting membrane of the ovum by a spermatozoon, during which process all of the spermatozoon except the tail and a portion of the body enters into the ovum. The portion of the body and tail not entered disintegrate and drop off.

10.—How do these two procreative parts come together?

A.—At the ripening of the ovum it is discharged from the Graafian follicle in the follicular fluid, and is carried by nerve force into the Fallopian tube and into the ampulla thereof; and at the proper time is projected through the uterus and is presented in the vagina; the spermatozoon leaves its nest in the tubule of the testis and floating in the semen of the male is impelled by nerve force through the vas deferens into the seminal vesicle and thence during the procreative spasm, through an ejaculatory duct into the urethra and through it into

the vagina, where the ovum and spermatozoon come in contact.

11.—What conduct immediately ensues following impregnation of the ovum?

A.—The impregnated ovum ascends into the uterus to a roughened surface somewhere in the fundus or body, to which it adheres.

12.—What process immediately follows the adhesion of the impregnated ovum to the wall of the uterus?

A.—The process called *imbedding;* that is, the ovum sinks into the mucous wall which thickens until it finally entirely covers and incloses it in a mucous capsule.

13.—So soon as the spermatozoon pierces the limiting membrane of the ovum, what conduct takes place?

A.—The general cytoplasm comes toward it, causing what is called the cone of attraction.

14.—So soon as the spermatozoon has entered, what are the two active elements of procreation within the ovum called?

A.—The female germinal center is called the female pronucleus, and the male germinal center is called the male pronucleus. These two are frequently referred to as the gametes.

15.—What is the next step of conduct that occurs within the ovum as between the two pronuclei?

A.—They gradually approach each other, and finally dissolve into a clear field, until finally, part way between where they disappeared, the first granulation, or formation and cohesion of particles to constitute the new being, takes place.

16.—What is this granular formation leading toward the production of the new being called?

A.—It is called the zygote, or pre-embryo.

17.—What should be said at this juncture of ova and spermatozoa?

A.—That while they are animal cells, they never form a part of tissue, but are separate and distinct, and have but one destiny and that is procreation when they contribute to each other; and unless they meet in that relation they disintegrate, not having capacity for any other function or office.

18.—What is the place called within the ovum where the original granulation to produce the new being occurs?

A.—It is called the embryonic area.

19.—Of what does the embryonic area consist?

A.—It consists of that restricted place or area in which the process of producing incipient cell-particles to form a new person is taking place.

20.—By what other name is this cell-producing area called?

A.—The morula.

21.—At cell-particle forming time what is the name given to the entire cavity of the ovum?

A.—It is called a blastula, from the idea of its being the place where these cells are being produced.

22.—What form do the original cells of the zygote or new person take?

A.—They spread out in layers like a stratified epithelium; the first layer being attached to the wall of the

ovum and the second lying in relation with it and so on.

23.—What are the names given to the first two layers of cells as they are produced in the morula?

A.—The layer that attaches to the wall of the ovum is called the ectoderm, or outside layer, and the other layer is called the entoderm or inside layer.

24.—What is the style of structure of the new forming person at the formative period of the ectoderm and entoderm?

A.—It is a flat, bilaminar, stratified epithelium.

25.—How far do the cells thus forming extend over the wall of the ovum?

A.—At first completely over it, converting the whole ovum into what is called a blastodermic vessel.

26.—Is there a line of demarcation between the embryonic area and the general blastodermic vessel?

A.—Yes. There is a differentiation in the form of the cells and their conduct, so that the walls of the blastodermic vessel, which was originally the ovum, are divided into what is called the embryonic area, and the extra-embryonic area.

27.—What is the ultimate purpose of these cells that form over the remainder of the ovum, aside from the embryonic area?

A.—They are eventually to be matured into the nutritive and protective structures, called the placenta and fetal membranes.

28.—At this juncture, can the embryonic area be made out by a strong magnifying glass?

A.—Yes, on account of the thickening of the cells and

their taking on somewhat of the columnar form, the embryonic area may be distinguished; it soon becomes ovoid in shape.

29.—What occurs near the head end of the ovoid, embryonic area at about this time?

A.—The ectoderm enfolds and rests upon the entoderm, while its cells become longer and more definite, and from the sides of this enfolded area another set of cells grows sidewise, which is called the mesoderm, and becomes the mesodermal layer or plate.

30.—What is the name given to the area where the enfolded ectoderm and laterally growing mesoderm occur?

A.—It is called the primitive streak, because it is the first shadow that can be definitely seen, and elongates into what is to be the long axis of the body of the person.

31.—During all of these changes, what should be said of the ovum which has now been converted, by the growth of cells, into a blastodermic vessel?

A.—It has continually grown or enlarged from the time of impregnation, and continues to grow until complete formation of the new person.

32.—At this juncture, what should be said of the embryonic area?

A.—By the time of the development of the mesoderm the embryonic area has taken on a pyriform shape, and is rapidly increasing in length in the caudal part or that portion away from the head, which serves to elongate what is called the primitive streak.

33.—What is the first structure definitely formed?

A.—The cerebral vesicle, which is the beginning of the brain; the differentiation in the shape of which, as growth goes on, converts it into what are called the four ventricles of the brain and the medulla or tube of the vertebral cord.

34.—By the time the nerve system is well formed, and some of the grosser structures, into what other divisions is the blastodermic vessel divided?

A.—Into the embryonic area, which is the portion occupied by the forming person; the amniotic, which is the general protection area, and is to compose the greater portion of the fetal membranes; and the placenta, which is and is to become the nutritive machinery until full term, or the time of delivery.

35.—What is the amnion?

A.—It is that portion of the new trilaminar membrane which extends around the margins of the embryonic area, and finally by its arrangement and the fusing of its edges completely enfolds the new forming person, or embryo, in what is thereafter known as the amniotic sac.

36.—What is that portion of the blastodermic vessel that lies between the forming person and the wall of the ovum, and that part of the uterus upon which the ovum rests, at this stage, called?

A.—It is called the chorionic area.

37.—What is finally formed in what may be designated as the center of the chorionic area?

A.—The placenta, and the umbilical cord, through which from the time of its completion nutriment is transmitted to the forming person.

38.—As development continues, a darker nodulated streak may be observed in the axis of the primitive streak, and what is this called?

A.—It is called the Notochord, and is the incipient presentation of the vertebral column.

39.—Where does the notochord lie?

A.—It occupies the space between the primitive neural canal and the primitive alimentary canal, as it continues thereafter to do throughout the animate period of the person.

40.—After the completion of the growth of the mesoderm what definite character of embryonic growth takes place?

A.—A gradual change from a flat into a folded or cylindrical structure, which continues to thus develop until the edges or margins of the embryonic area fuse at the ventral mid-line, thus inclosing the primitive alimentary canal and body cavity. Part of the line of closure is later known as the ventral white line.

41.—What is meant by folding off of the embryo?

A.—The embryo folds off by loosening from its attachment to the embryonic area of the ovum when the placenta and umbilical cord are sufficiently formed, together with the fetal membranes, that the embryo can be more safely protected and surely supplied with nutriment, away from that wall than attached to it.

42.—What is the last portion of the embryo to close ventrally?

A.—It is the umbilical orifice, through which the umbilical cord extends, carrying the umbilical vein to the

embryo for nutriment, and receiving the umbilical arteries, which extend back to the placenta, and carry the blood, which has passed through the body of the embryo or fetus, back to the placenta.

43.—What is the placenta?

A.—The placenta is a mechanism composed of two parts, one called the maternal and the other the embryonic, which are interwoven with each other by an array of placental villi, but are never united; the arrangement and relation being such that lymph from the blood of the mother passes through the winking spaces in the villi membranes, into the lymph, and finally into the blood of the embryo or fetus.

44.—What is the size of a fully developed placenta?

A.—When fully matured it is a discoid mass, about twenty inches in circumference and one and one-fourth inches in thickness at its center, gradually decreasing from there, being very thin at its margins. When divested of all other membranes it weighs about one pound.

45.—When does the embryo put on characteristic human formation?

A.—Only after it has folded off. It then presents definitely the characteristic head, trunk, arm and leg buds, after which it undergoes rapid development.

46.—What is the period of gestation in the human family?

A.—It is considered to be nine calendar months, or from 270 to 280 days.

47.—What steps are included in the period of gestation?

A.—The time allotted includes impregnation, imbedding into the wall of the uterus, all of the final developments until folding off takes place, and until the child has reached full maturity or complete development as a fetus.

48.—What has the complete development of the fetus been called?

A.—It has been called full term, term time, or time for delivery.

49.—Technically, what is meant by delivery?

A.—By delivery is meant all of the steps and phases incident to the descent of the fetus into the pelvis, the dilation of the cervix of the uterus, and final expulsion of the child from the mother's body.

50.—In practice, what does this also include?

A.—It includes not only the delivery of the child, but finally the delivery of what is called the after-birth, which consists of the placenta and all of the fetal membranes, including the placental part of the umbilical cord.

51.—When does air, or breathing, become necessary to the fetus?

A.—So soon as the condition arises at which the placenta ceases to operate as such. This usually takes place immediately upon expulsion of the fetus. It is then essential that the child be given opportunity to breathe, and that the umbilical cord be severed as soon as possible.

PHYSICS

INTRODUCTORY NOTE

A KNOWLEDGE of Physics, as preparatory to the study of Chiropractic, is important from a standpoint not usually included in the objects of such study.

It is usually thought important that the student should understand the laws of physics in order that he might carry them forward and into operation in laboratory experiments, more for the purpose of disciplining the mind than anything else.

In the present study, however, the chief object to be attained is to understand the law of the operation of material parts under the application of force, in order that the student may understand bio-anatomy, or the physiologic action of inanimate particles of matter under the application of life force.

The student will enter upon this study with the general knowledge that inanimate particles, or organized masses, move and perform their various phases of conduct under the influence and direction of force; and it is for the purpose of having him better understand how force that causes animation, by acting through and upon particles of unorganized matter, in a definite way, causes them to be related or organized in such manner as to produce so-called animate structures, or organisms, that the following quiz has been prepared.

The student is cautioned at this time not to allow himself to be carried away by the attractive mathematical phases of the work, although a proper knowledge of that is to be desired; but to be very particular at all times to obtain an understanding of the effect of the application of force to matter, and the remarkable phenomena that occur as a sequence, with the one object in mind; the understanding of the application of nerve stimulus in the human organism and its effects, upon the inanimate particles that enter into the composition of the human body.

The student is referred to and encouraged to read carefully "Elements of Physics" by S. E. Coleman, edition of 1906, which may be purchased of D. C. Heath & Co., Boston, Mass.

PHYSICS QUIZ

1.—What is the Science called Physics?

A.—It is the systematized knowledge of the action of matter under the operation of force.

2.—What are the so-called physical sciences?

A.—They are any phase of science which deals in any way with matter. Therefore, they are: Psychology, biology, physics, chemistry, botany, zoölogy, astronomy, geology, meteorology, mineralogy and so forth.

3.—With what does physics deal?

A.—It deals with all of the phenomena that grow out of the application of force to matter. That is to say, all conduct of matter is the result of the application of

force to it, and physics is only a description of what matter does under such application, and the explanation as to why it does it.

4.—What is the object of the study of physics in our present work?

A.—It is to prepare the student to carry out mentally the law of the application of force to all characters of matter, whether in psychology, chemistry, geology, physics, etc., or what not, and to make adaptation from that knowledge to the movements of the particles of matter composing the human body, and to understand the law of the application of force and its effects to and upon the same.

5.—In how many states is matter said to exist?

A.—Matter is said to exist in four states; that is to say, gas, liquid, colloid and solid. The student will understand that, in a certain sense, there are no solids, and that there is a considerable novelty about gases, liquids and colloids. The line of demarcation not being too definite between these since they merge from one into another.

6.—What is it that distinguishes liquids; but more definitely colloids, from solids?

A.—Liquids and colloids tend to flow if not restrained, and therefore must have containers. The student is cautioned, however, that solids also tend to change their shape constantly in ratio with the cohesion of their particles.

7.—What is gas?

A.—It is an invisible fluid that has neither definite

form nor volume. Incident to this fact, gases present great diffusibility and permit of great compression.

8.—Of what value to the student of Chiropractic are the facts just stated?

A.—The human body is composed very largely of gases, and a knowledge of the action of gases under all circumstances is of the utmost value.

9.—If gas and liquid are both fluids, why is a gas not a liquid?

A.—Because liquids have definite volume.

10.—What is a colloid?

A.—It is a liquid in which is immersed particles of solids so small that their ponderability is overcome by their capillary attraction so that they are held in suspension, or tend to float in the liquid at fixed distances from each other.

11.—What is the peculiar fact that distinguishes a solid from either a liquid or a colloid?

A.—A solid has definite form which it tends to maintain with resistance, which it requires definite force to overcome.

12.—What is force?

A.—Force, from the standpoint of physics, is a universality that exerts a push or pull applied to matter, and it is always understood that force is applied from an extraneous source, or from outside the matter, and is not in any sense inherent in the matter, but is projected from elsewhere.

13—What is energy?

A.—The student will observe that in physics energy

is looked upon as an inherent quality possessed by a body. From that standpoint energy is a useless term, for a body has not inherent energy. It only has capacity to express power because of its place and relation. Energy is frequently used interchangeably with force. This is not correct. Energy frequently is power, but it is never force.

14.—What is kinetic energy?

A.—The power which a body seems to possess by virtue of its mass and velocity is called kinetic energy. It will be noticed that the introduction of the word kinetic as a differentiation of energy is not of any value.

15.—What is inertia?

A.—It is found that all bodies in equilibrium and in such position as to continuously respond to gravitation, which is equally resisted, remain as it were at rest, and move only when force sufficient to overcome the state of rest is applied from some direction. This condition of being at rest under the equilibrium of force is said to be inertia.

16.—What is the universal tendency of all bodies in motion?

A.—To come to a state of rest; that is, to come into a relation where they respond specifically only to the attraction of gravitation, being prevented from going toward the center of the earth by sufficient resistance.

17.—What is that phenomenon called which produces the tendency to inertia?

A.—It is friction, sometimes called resistance.

18.—As a result of the facts presented by the two pre-

ceding questions, how long would a body set in motion continue in a straight line?

A.—Always, unless influenced by other phases of force than that which put it in motion.

19.—What valuable truth preparatory to a knowledge of Chiropractic is to be obtained by an understanding of the preceding questions relative to force and friction?

A.—It is, that any part of the body constantly tends to inertia by constantly meeting with friction or resistance and that the tendency to inertia can only be overcome by the constant application of force applied through organized channels, the same being applied from a constant and inexhaustible source.

20.—May bodies be moved without known physical contact?

A.—Yes! the earth draws all bodies upon it toward its center. The electric pole of the earth attracts the needle of the compass and so forth to many illustrations.

21.—What should the student learn from these facts?

A.—That if bodies can be drawn by magnets and the attraction of gravitation, that they must be compelled or impelled by a phase of force distributed from a constant source.

22.—Is the fact stated in the last answer important in the preparation for the study of the human body?

A.—Yes, for absorption, liquid transportation, the construction of the body called metabolism or assimilation and depuration are accomplished by the constant action of a phase of distributed force, called nerve stimulus or life force.

23.—What is the law of mutual action of bodies?

A.—That when one body is compelled by force to act upon another, the second body exerts at the same time a force upon the first in the ratio of its size and weight, the phase of force being of the same type.

24.—How are measurements accomplished?

A.—Measurements in physics are an attempt to express the physical quality, such as length, surface, volume, force, velocity, mass, etc., and for the purpose of these measurements a fixed amount of each character is taken as constituting a unit of measurement, such as an inch, a foot, a meter, a centimeter, a yard, a barrel, a ton, a perch, a cord, etc.

25.—What is extension?

A.—Extension is that property of matter by virtue of which it is said to have length, width and thickness, and to present size, bulk, or volume.

26—What is weight?

A.—Weight is the measure of the attraction of gravitation operating upon any body, drawing it toward the earth's center. The place of weight standard is called ocean level.

27.—What is mass?

A.—Any two bodies at the same place which are of the same size and weight are said to be of equal mass.

28.—What is density?

A.—Density of matter is said to be the mass of a unit of its volume. In the metric system it is usually expressed as the number of grams in a cubic centimeter. In English, as the number of pounds in a cubic foot. The

student should note that density is an important subject, as, in the study of Chiropractic, it relates specifically to human tissues.

29.—What are the laws of liquid pressure?

A.—The laws of liquid pressure are said to be as follows: 1. The pressure at any point in a liquid at rest is equal in all directions. 2. The pressure of a liquid at rest is at right angles with any surface upon which it acts. 3. At any point in a liquid the pressure due to its weight is proportional to the depth of the point below the free surface of the liquid. 4. Pressure is the same at all points in the same horizontal plane. 5. At the same depth in different liquids the pressure due to weight is proportional to the density of the different liquids. The student will observe that the first law stated is not quite correct. The pressure is equal in all directions except toward the center of the earth. In that direction there is more force exerted and more resistance expressed than in any other.

30.—What effect does the shape of a containing vessel have upon a contained liquid?

A.—None whatever.

31.—What is Pascal's law of liquid pressure?

A.—Pressure exerted upon any part of the inclosed liquid is transmitted undiminished in all directions and acts with equal force upon all equal surfaces and at right angles to such surfaces. It will be observed that this law is correct with the exception of directly away from gravitation. The student should observe this law carefully, since it applies to each of the thirty-two or more liquids

of the human body, the operation of which he is to definitely understand in mastering Chiropractic.

32.—What is the law of buoyancy of liquids?

A.—Liquids express a supporting force upon any body immersed or partially immersed in them. This is spoken of as liquid buoyancy. If the buoyant force exercised upon a body immersed or partially immersed is equal to or greater than its weight, the body will float. Otherwise, it will sink. The apparent weight of any body immersed in liquid will always be less than in the air.

33.—What is specific gravity?

A.—Specific gravity is the ratio of the density of a substance or body to the density of distilled water, at a temperature of four degrees Centigrade. Except for laboratory purposes, ordinary temperatures are taken, four degrees Centigrade being the laboratory test for exact measurements; but for the student in the present study the specific gravity of a substance may be considered as being the ratio of the mass or weight of that substance to an equal volume of water.

34.—How is specific gravity found?

A.—If the density of the substance per cubic foot is known, its specific gravity is found by dividing that number by 62.4. Of course, if the density is known in the metric system its specific gravity will appear without further computation.

35.—How is specific gravity of solids denser than water found?

A.—The solid is weighed, then suspended by a thread from a pan of the balance and again weighed while hang-

ing wholly immersed in water. The difference between these weights, measure the buoyant force of the water upon the body and is therefore the weight of an equal volume of water.

36.—Does the atmosphere express pressure?

A.—Yes. The atmosphere is presumed to consist of layers of ever decreasing density upward, comprising the entire thickness of the atmosphere surrounding the earth. And it is the concensus of opinion generally, that the pressure of the whole atmosphere at ocean level is fifteen pounds to the square inch.

The student should note that for a person of average size this would amount to about thirty-five thousand pounds of pressure, and serves to give the student some idea of the tremendous resistance which tissues must present and maintain, the remarkable thing being, that in health we are unconscious of this pressure; but not so under certain phases of disease.

37.—Of what value to the student are the answers to the last several questions with regard to density, buoyance, and specific gravity?

A.—They serve to give him a working idea as to the suspended particles composing the colloids in the liquid transportation system and those colloids when occupying the small spaces between the molecules of the body, and make it possible for the student to understand what is meant by precipitation, particularly in the areas of stases.

38.—What is meant by the spring of the air?

A.—A given area of atmosphere has a tendency to ex-

pand in all directions. Its expansion, generally speaking, is resisted by a phase of force equal thereto. If more than that force is applied the atmosphere of the area is made denser, but reacts to its original expansion instantly the pressure is removed.

39.—What is Boyle's law as to the spring of gas, usually considered under the term air?

A.—It is that the temperature remaining the same, the volume of a given body of gas or air varies inversely with the pressure upon it. This proposition is of value to the student, since frequently in the animate organism this phenomenon is met with in relative gas pressures and in abnormal pressures of a retained gas.

40.—What is the law of measurement predicated upon Boyle's law?

A.—It is that the temperature remaining the same, the density of a gas or the air is proportional to the pressure upon it.

41.—Do the laws just stated aid us in considering the question of respiration or breathing?

A.—It can be seen that if the muscular resistance of the thorax was equal to atmospheric pressure, no air could be taken into the lungs and this has been observed in certain cyanotic conditions. It has been found that respiration requires muscular action, in raising the thorax and enlarging the thoracic capacity in coördination with atmospheric pressure in the first instance, and with the spring of the air and muscular compression in the second instance, all of which accounts for the phenomena of inspiration and expiration.

42.—What are the properties of matter?

A.—It has been suggested by physicists that the most important properties are those of expansion, inertia, divisibility, porosity, density, compressibility, elasticity and indestructibility; and incident to these there are rigidity, flaccidity, brittleness, hardness, tenacity, transparency, color, odor, etc. These are well in their way, but they can in a general sense be reduced to four classifications for the use of the student in this view of the subject, the four being: Size, shape, color and density; these as being fundamental, and establishing and maintaining the relation, when the thought is being applied to the phases of animation that constitute health in the first instance and then to maintain it.

43.—To what extent may matter be divided?

A.—Matter can be divided indefinitely and may be divided until the resulting particles can no longer be seen. Deductively, we can readily understand that matter can be divided until it changes its form, but that it can never be divided out of existence.

44.—What is the substance left after the last division of matter, before it would become the gases composing it, called?

A.—It is the general claim of physicists that this is called a molecule. The student will observe that since there are presumed to be about twenty quadrillions of molecules in a cubic millimeter of any gas at atmospheric pressure and under ordinary temperatures, the word molecule is not valuable to us except as the name of a conception, and to designate a phase of thought; it being

admitted that in no given substance could the molecule be ascertained. But for all practical purposes it is the name of the result of an abstract analysis rather than of an actual entity.

45.—When molecules or particles are related to constitute a substance, what name do the interstices therein receive?

A.—They are called physical pores. Physicists seek to make some differences between these and pores which can be seen, but the important fact for the student to remember is that no substance has ever been known, which is sufficiently dense to exclude physical pores; in other words, molecular interstices.

46.—What is diffusion as related to gases?

A.—When two gases are brought in contact and left undisturbed they quickly mix with one another. Even in gases where they are of such different consistence as to ordinarily prevent such mixing. The student should try to fully comprehend this fact, since it is to some extent involved in all phases of respiration and also in all phases of final elaboration and assimilation, and should be definitely considered in connection with the conduct that occurs as incident to a liquid stasis.

47.—Is diffusion also a property of certain liquids or colloids?

A.—Liquids and colloids, the molecular consistence of which is such that they can be admixed, no matter which is on top, are gradually mixed by the process of diffusion, in every way similar to that of gases. It must be kept in mind that the molecular consistence of certain liquids

is such that no diffusion will take place between them. This may be illustrated by raw linseed oil and water. The law of diffusion in liquids is important because it relates to digestion, absorption, liquid transportation, aeration, extrusion, final elaboration and assimilation, in the construction of every character of tissue.

48.—What is the tendency of molecules of matter to stick together called?

A.—It is called molecular attraction, or cohesion. The word adhesion is sometimes used where the substances are dissimilar. It is important that the student gain a very comprehensive knowledge of this law, for without that knowledge he could not understand tissue construction and maintenance; in other words, assimilation could not be understood without understanding the law stated.

49.—What is the difference between cohesion and adhesion?

A.—It amounts only to a novelty introduced for the purpose of differentiating between the law of attraction between substances of the same consistence, and those of different consistence. In other words, cohesion applies to molecules of like substances, while adhesion refers to the same conduct between the molecules of any other substances.

50.—Are cohesion and gravity the same?

A.—No. Cohesion is the result of capillary attraction, obtained by reducing porosity and adding capillary contact. Cohesion and adhesion are, however, generally increased by the influence of gravity applied to the substance in question. It is well for the student to get a

clear conception of these, for cohesion is the law that retains animate structures in the conduct of animation, while gravity tends to molecular disintegration, and yet, as a supporting proposition, also tends to increase cohesion under certain circumstances. The student must not forget that the attraction of gravitation exercises compression upon animate substances as they go from ocean level toward the center of the earth, so far as tests have been made, and increases divergence and porosity and has a tendency to lessen cohesion in going away from ocean level. These conclusions are important in considering health at different levels upon the earth's surface.

51.—What is heat?

A.—There is no such thing as heat. What has been called heat is but a phenomenon incident to friction. So-called heat is always in ratio with the amount of friction. It must, of course, be understood that there is a phase of force applied to the matter under consideration compelling vibration, which produces friction. Of course, given the same chemical ingredients, the greater the vibration the greater the friction, and therefore the greater the heat. Under the same circumstances heat is always proportional to friction.

52.—What is temperature?

A.—Temperature is the result of so-called heat. In other words, it is the composite expression of the amount of friction in a given substance. When we are speaking of animate things and speaking of the temperatures of them, we are talking of the composite expression of all

the phases of friction that are taking place incident to the process of animation of a given organism under consideration.

53.—What is the process called by which heat is carried from a hotter to a colder substance or part?

A.—It is called conduction. And it must be remembered that this is important to the student of the body; without regard to size, conduction will always take place from the so-called hotter to the colder body, or from the hotter to the colder part in a given body.

The answers to 51, 52 and 53 are of extreme value to the student in understanding what temperature of the human organism means, or, so far as that is concerned, temperature of any animate body. It also aids him in understanding rises of temperature which have been called fever, and falling temperature, which has been called sub-temperature. The student is encouraged to very carefully fix these laws in his mind.

CHEMISTRY

The reason for a knowledge of chemistry, as a preparatory study to that of Chiropractic, lies in the fact that the human organism is not more nor less than a chemical compound.

It is, of course, impossible to know the analysis of the compound composing the human body with exactness, and yet by a multitude of analyses that compound has been approximated and the approximation furnishes a basis for reasoning to certain definite conclusions which are of much value to the student.

It would indeed be impossible for the student to attain to anything like a definite knowledge of the science of Chiropractic without being well versed in chemical analyses.

It would be easily possible, however, for the student to waste much time in connection with the development of a practical knowledge of chemistry, for the reason that aside from a few well defined generalizations, chemistry, as it exists to-day, is but a series of disrelated experiments.

The student preparing for the study of Chiropractic is therefore cautioned, that it is not necessary for him to waste his time in a multitude of speculative investigations, but that it will be ample for his purposes if he attains to a knowledge of that, which may really be said

to be true, in connection with chemistry as it relates to physics.

Analytical chemists by concensus of opinion have declared the chemical formula of the human organism to be approximately:

Oxygen,	72.00
Hydrogen,	9.10
Nitrogen,	2.50
Carbon,	13.50
Phosphorus,	1.15
Calcium,	1.30
Sulphur,	.147
Sodium,	.10
Potassium,	.026
Chlorin,	.085

Traces in small and variable amounts of fluorine, iron, magnesium and silicon.

CAUTION: The student must note at this point that this formula cannot be relied upon as a verity, but may only be taken as a basis from which to reason in reaching approximation, as to the formula actually presented by the person under investigation; and it is to be used as a basis for comparison and analysis with respect to phases to be stated in this work.

CHEMISTRY QUIZ

1.—What are the signs and symbols used in Chemistry?

A.—There are many signs and symbols, too many to state in this outline. They consist of abbreviations for the names of elements, compounds, derivatives, etc.; and

signs to indicate the comparative amounts used. For example the composition of water is said to be hydrogen two parts and oxygen one part. The formula is usually written H_2O, or OH_2. The student would do well to look these signs and symbols up carefully. For a hasty understanding see section 38, page 35, of Elementary Manual of Chemistry, by Storer and Lindsay.

2—What is an Element?

A.—The answer to this question is of the utmost importance to the student in substantially any phase of investigation.

It is not difficult for any one to see that any analysis must begin with a unit, or what is conceived as a single thing, or must revert to a unit or what is conceived as a single thing.

Any chemical investigation must be based upon a unit, something that may be isolated and considered independently; something, therefore, that may in a sense be indicated, known and understood.

The student must know that in different periods of the history of chemistry elements have been held to be widely different.

In the time of Aristotle it was thought that the universe consisted of four elements: earth, water, air and fire.

In the sixteenth century this was changed to what was called the formula of the alchemists which was salt, sulphur and mercury.

In about the year 1680, Robert Boyle completely rearranged the language of chemistry in such manner as to incipiently state our present ideas.

An element then speaking from the standpoint of chemistry is held to be a definite and specific substance which may be isolated, separately considered, and is presented in the smallest form that can exist without combination.

CAUTION: The student must understand that this idea of an element is indeed very vague and that actually no such thing as an element has as yet been discovered, yet he must remember that the separation of gases to a certain extent can be accomplished, and in that sense, a very careful comprehension of what is meant by an element is of the utmost importance to the student.

3.—How many elements altogether are now supposed to exist?

A.—The Eighty-one elements now presumed to exist, according to Tilden, in the order of their anatomic weight are as follows:

Hydrogen	1.008	Titanium	48.1
Helium	4.0	Vanadium	51.2
Lithium	7.00	Chromium	52.0
Beryllium (Glucinum)	9.1	Manganese	54.93
Boron	11.0	Iron	55.85
Carbon	12.00	Nickel	58.68
Aluminum	27.1	Cobalt	58.97
Silicon	28.3	Copper	63.57
Phosphorus	31.0	Zinc	65.37
Sulphur	32.07	Gallium	69.9
Chlorine	35.46	Germanium	72.5
*Argon	39.9	Arsenic	74.96
Potassium	39.10	Selenion	79.2
Calcium	40.09	Bromine	79.92
Scandium	44.1	Krypton	83.0

Rubidium	85.45	Cerium	140.25
Strontium	87.62	Praseodymium	140.6
Yttrium	89.0	Neodymium	144.3
Zirconium	90.6	Samarium	150.4
Niobium (Columbium)	93.5	Europium	152.0
Molybdenum	96.0	Gadolinium	157.3
Ruthenium	101.7	Terbium	159.2
Rhodium	102.9	Dysprosium	162.5
Palladium	106.7	Erbium	167.4
Silver	107.88	Thulium	168.5
Cadmium	112.40	Ytterbium	172.0
Nitrogen	14.01	Lutecium	174.0
Oxygen	16.00	Tantalum	181.0
Fluorine	19.0	Tungsten	184.0
Neon	20.0	Osmium	190.0
Sodium	23.00	Iridium	193.1
Magnesium	24.32	Platinum	195.0
Indium	114.8	Gold	197.2
Tin	119.0	Mercury	200.0
Antimony	120.2	Thallium	204.0
*Tellurium	127.5	Lead	207.10
Iodine	126.92	Bismuth	208.0
Xenon	130.7	Radium	226.4
Cæsium	132.81	Thorium	232.42
Barium	137.37	Uranium	238.5
Lanthanum	139.0		

* Argon and tellurium are placed out of numerical order on account of the uncertainty still attaching to the relative values of their atomic weights and those of the elements immediately following them.

4.—What is a molecule?

A.—A molecule is the smallest portion of a chemical element that can exist by itself. The term, that can exist by itself, means which by further subdivision would become other gases or substances.

5.—What is an atom?

A.—It is the smallest part of an element or compound ever found in a molecule.

CAUTION: The words molecule and atom have been greatly abused by indiscriminate use. This must not be permitted to obtain in chemistry, for in that subject, atoms are always parts of molecules.

There is, however, another use of the word atom, which is clearly justified and is in common usage, in which sense the word atom is used to designate a part of the original element. This use of the word is only permissible when the student understands just what he means to convey by it, to-wit: The smallest part of the element spoken of which could exist by itself. In other words, calling that part of the substance such as water, which by being subdivided would become part of a gas, of which water is composed, an atom. It must, however, be remembered that it was using the word atom in this sense that introduced confusion of terms, and since there is no advantage to be gained by this use it is definitely discouraged.

6.—What is meant by atomic weight?

A.—It is that the atoms of all elements capable of entering into compounds are weighed and then a standard common to all selected and in our chemical terminology the atom of hydrogen has been selected for that purpose.

7.—What other terms have the same value, or chemical significance, as that of the element?

A.—Simples, primary substances, etc. In fact, any term that indicates the smallest part or primary, integral phase of a substance.

8.—What is a compound?

A.—It is the resulting substance obtained by the combination of two or more elements or simples. The student should make a profound investigation of compounds in every authoritative direction, for a well defined conception of compounds is necessary to an understanding of the physiologic and pathologic processes of the body.

9.—What should we understand and fully realize as to the number of chemical compounds in the composition of animals and plants?

A.—That such compounds are so numerous as to be wholly beyond comprehension and are entirely too complex for definite analysis, but that these can be understood to a certain extent, to such degree in fact as to aid much in investigation.

10.—Is the multitude of compounds expressed by the different organisms a significant fact to the student of the human body?

A.—Yes, a knowledge of compounds and how they form is of much assistance in understanding the conditions and conduct in a given case. While the student should always realize that it is impossible for him to know the exact formula, yet a general knowledge of compounds and the manner of their changing will help him to appreciate the multifold function of the human body, and to gain a clear impression as to how its animation is maintained and how its inanimation becomes necessary.

11.—Are there still significant facts with regard to compounds that should be learned as to animals?

A.—Yes, on account of this very important fact; animal substances are, and it is proper that they should be,

used for human food and therefore the greater knowledge we have as to how compounds produce various tissues and structures, the more definite will be our knowledge as to the proper consumption of such substances.

12.—Is the study of compounds just as valuable a subject as related to the vegetable world?

A.—Yes, for since substances from the vegetable world form the greater part of the food of human beings, the subject is rendered just that much more comprehensive and important, because characteristic structures depend upon definite formulæ, and definite structures are necessary to correct consumption. It, therefore, becomes necessary that as accurate knowledge in this direction as is possible, shall be obtained.

13.—What is a solution?

A.—A solution is the product of a substance immersed in water until its particles have so completely lost character and dispersed, that they can no longer be separated from the water by the process of filteration, that is, by passing the water through a porous medium as fine as water will go through.

CAUTION: Since much the greater part, if not all, of digestion is accomplished by solution the value of an understanding of this subject becomes at once apparent to the student.

14.—What is a chemical solution?

A.—A chemical solution is obtained by immersing such a substance in a simple solution, until its particles are dissolved and dispersed into the simple solution and have in that sense become identical with it.

CAUTION: This process is also of extreme importance for the student to comprehend, for it is constantly going on when drugs have been given or inoculation performed, and also in the production of phases of pathology or disease.

15.—What is a tincture?

A.—A tincture is a solution which cannot be produced in water, which is therefore said to be insoluble in water, but is accomplished by the use of some other dissolving agent. At this time alcohol is the agent nearly always used for that purpose.

16.—What is a medical tincture?

A.—It is the product of a solution in alcohol of substances classed as being medicinal.

CAUTION: The student should understand that whether such substances are medicinal or not is determined by their ability to undergo "chemical solution" in the body and homogeneously combine with the formula of the body, or fail to do so.

AIR

17.—What is air?

A.—Air is a compound of invisible gases, and is part of the atmosphere, which envelops the earth to a thickness of fifty to two hundred miles, and is that portion of the atmosphere in which it is possible to maintain animal existence.

CAUTION: The student should make a very clear differentiation in his mind between air and atmosphere.

It is undoubtedly true that human animation cannot be maintained in much the larger area of the atmosphere, and that animation can only be maintained in air. We can easily understand that at this time little is known of the chemistry of atmosphere and yet we can recognize it as forming some necessary relation to us, but the thing desired in the present view is to become familiar with the characteristics of air as distinguished from atmosphere, in connection with our breathing it and in that manner obtaining the use of its necessary gases for material maintenance.

18.—Is air ponderable, that is to say, does it have weight?

A.—Air has weight and is subject to the law of gravitation and within the distance of experiment from the earth's surface it responds to the attraction of gravitation as do all other ponderable substances.

19.—What do we mean by the chemistry of air?

A.—We mean the chemical formula which composes air. The principal ingredients of air have been found to be one part oxygen to four of nitrogen. It is known, however, that air contains many chemical phases and that as yet its chemistry is not fully known. A careful study of the chemistry of atmosphere is of much importance, for it relates directly to the subject of what character of country, elevation, etc., different people are best adapted to live in.

20.—What is oxygen?

A.—It is said to be an original elementary gas composing about one-fifth of the atmosphere. Of course, it must

be admitted that this is not telling what it is, but what it does, and it should be suggested that it is very much more important for the student to get a good idea of what oxygen does, than to spend time trying to ascertain what it is, for it is not likely that will ever be known.

21.—Is oxygen plentiful at or near the surface of the earth?

A.—Yes, oxygen is the most widely diffused and abundant substance known.

CAUTION: Since this is true the student should understand that careful provision should be made at all times to have an unmolested and abundant supply of oxygen, since its use is primarily essential.

22.—Is any portion of the earth's crust composed of oxygen?

A.—It is estimated that about one-third of the crust of the earth is composed of oxygen. The rock of our mountains are about 45 per cent oxygen.

23.—Does oxygen enter into the composition of water?

A.—Oxygen is the chief ingredient of water. The student will realize the great importance of this fact when he comes to the study of the human body, for the more important parts are composed of about 92 per cent water, the animate parts of bones are composed of about 35 per cent, and the whole body taken together is composed of about 75 per cent water. The necessary use of water then in great abundance for the maintenance of health and strength is at once apparent.

24.—Do hard, dense substances such as flint rock, quartz, etc., contain oxygen?

A.—Yes, about one-half the weight of such substances is oxygen.

25.—Does oxygen readily enter into compounds with other gases and substances?

A.—Yes, it is believed that with a single exception oxygen enters into compounds with all other elements. Temperature, that is, friction, has some influence on the readiness with which oxygen enters into compounds but that is all.

26.—What is the compounding of oxygen usually accompanied with?

A.—It is said that the compounding of oxygen at high temperature is usually accompanied with light and heat. The student should know that "high temperature" means that the molecules of the substance under such a situation are by the application of a phase of force put into rapid vibration, causing friction, which results in the phenomena called light and heat.

27.—What is the process of combustion?

A.—It is what has been called oxidation, that is, the oxygen of the air, incident to the application of force resulting in increased vibration admixing with the gases of the substance to be burned. The process has been lamely called combustion.

28.—What is combustion?

A.—Combustion is simply the admixing of the oxygen and gases of the substance involved with the oxygen and other gases of the air under the application of a phase of force producing friction or so-called heat accompanied by the phenomenon called light.

29.—Do the facts stated in the last several answers with respect to compounds have value to the student preparing for the study of the human body?

A.—Yes, the knowledge of these facts are of the greatest value, for since increased friction results in increased heat incident to the release, by force, of oxygen of the substance and its combination with that of air, therefore, this phenomenon is fully explanatory of fever and subtemperature. The student is encouraged to follow the subject of the so-called combustion of oxygen and influence of vibration and friction as widely as he finds it possible, since they are of the utmost importance in understanding final elaboration, assimilation, and normal and abnormal temperatures of the human body.

30.—What is the only element with which oxygen is said not to combine?

A.—It is argon, which resists all efforts to combine it with any element. The student will find the subject of argon discussed in the Americana Encyclopedia, vol. II.

31.—What is nitrogen?

A.—It is said to be a transparent, colorless, tasteless, odorless, incandescent gas not quite as heavy as that portion of atmosphere which we call air.

32.—What is the difference between nitrogen and oxygen from the standpoint of conduct?

A.—Nitrogen is classified as being inert, that is, negative or not active, while oxygen is classified as being active or combinative in its conduct.

33.—Does nitrogen readily enter into combination with other elements?

A.—No; because of its being inert it very slowly enters into any combination.

CAUTION: The student will very carefully note the properties of nitrogen so far given as being of the greatest importance incident to the production of negative phases in animals and it must be remembered that these facts are fully explanatory of the subject of minus temperature in human beings.

34.—Could animation be sustained in an atmosphere of nitrogen?

A.—No. Animation could not be sustained in an atmosphere of pure nitrogen.

35.—Is nitrogen poison?

A.—No; notwithstanding animation could not be sustained in it, for in combination with oxygen it is the basis of and necessary to respiration and the body formula.

36.—What is the principal influence of nitrogen as a component of air?

A.—Its principal business is to dilute oxygen.

CAUTION: It is at this juncture that the student must think carefully for, since the use of nitrogen is to dilute oxygen, then this free dilution is necessary to the friction that produces normal heat in the body, while an excess of it would result in an excess of friction of the oxygen involved and render it more stable.

37.—Is nitrogen plentiful?

A.—Yes; it is very plentiful in the air, existing as what is called free nitrogen.

38.—What proportion of the air consists of nitrogen?

A.—About four-fifths of its volume.

39.—Does nitrogen enter into the composition of animal and vegetable substances?

A.—Yes. It is a constituent of the flesh of all animals and the substance of all vegetables.

40.—Does nitrogen enter into many combinations?

A.—Yes; notwithstanding its negativity and inertness, it nevertheless becomes combined by an indirect process with many other elements. It is important for the student to know this, because he is to learn that in all pathologic conditions where there is an absence of oxygen, the indirect phase of nitrogen combination becomes the dominant conduct.

WATER

41.—What is water?

A.—At ordinary temperatures water is a transparent liquid having neither taste nor smell, said to be composed of the formula H_2O.

Note: From the beginning of history relative to chemistry, water has been, in a certain sense, considered as a natural element. Chemists say, with childish artlessness, "water is another natural substance," seemingly forgetting that all substances are natural.

The important point to remember is that water is always water; it is an indestructible phase of matter and is of the greatest importance in the maintenance of animation; it is primarily involved in all animate structures and very largely in all animal formations.

As has been said, our bodies consist of about seventy-

five per cent water, indeed our entire body is but a solution in which the principal ingredient is water.

To fix the importance of the proposition in the student's mind let him remember that water is the one continuous and essential phase of food or nutrition without an abundance of which animation cannot be maintained.

As a preparation for the study of the human body a few further definite facts will be set forth respecting water.

42.—Is it possible that water can ever be anything but pure?

A.—No, for to say otherwise, would be to admit its destructibility. The water in a simple or chemical solution or a tincture is just as pure as it is anywhere else.

43.—Has water any color?

A.—Water without other substances held in solution in it is colorless. In great masses as in mid-ocean and lakes it appears blue or green. This, however, is because of the substance held in suspension in it.

44.—What is the unit for weighing water?

A.—It is a gram.

45.—How is a gram of water for this purpose obtained?

A.—By taking a cubic centimeter of water at 4° Centigrade, the temperature at which it is densest, and weighing it in what should be called a potential vacuum.

46.—Is the unit of water thus obtained a standard for weighing other substances of equal bulk?

A.—Yes. The unit of water weight is used as a stand-

ard by which to measure all other substances of equal bulk.

47.—For the purpose of weighing other substances, what is the unit of water weight called?

A.—It is called Specific Gravity.

48.—How is a gram of water or any other amount used as a unit compared with other substances?

A.—They are weighed by bulk, a certain volume of water and an equal amount of the substance to be weighed, and the weight of the water is compared to the weight of the other substance. The relationship, by weight, that the other substance sustains to the water is said to be its specific gravity. Equal bulks of gold and water thus weighed gives gold a specific gravity of 19.3 which means that gold is 19.3 heavier than an equal bulk of water.

METRIC SYSTEM

49.—What is the metric system?

A.—It is a system used by scientific writers in many of the nations of Europe and is based upon a unit called a meter which is presumed to be one ten millionth part of the distance on the surface of the earth from the pole to the equator.

Note: At this juncture it is suggested that the student familiarize himself with the metric system, for he will constantly use it in chemical measurements.

50.—Is water also the standard of heat?

A.—It is the standard of specific heat. The rule for

ascertaining specific heat is that temperature at which ice melts, as one fixed point called 0° and the temperature at which water boils under a pressure of 760 mm. of mercury is another fixed point and is 100° Centigrade. By use of these two, any specific heat may be easily computed.

51.—In how many forms does water exist?

A.—Three: solid, liquid and invisible gas.

52.—What is solid water called?

A.—Ice or snow.

53.—What is the name given to invisible water?

A.—Steam.

54.—What is water not liquid and still visible called?

A.—Vapor which may be also in the form of fog or cloud.

55.—What is the name given to all other phases of water?

A.—The other phases of water are called liquid.

56.—What is water called in which there is a solution that tends to be permanently suspended?

A.—It is called a colloid.

57.—In the various phases described, is there any change in the chemistry of water?

A.—No. The chemical formula remains the same whether in ice, snow, fluid, vapor, fog or cloud.

58.—What is the temperature at which ice melts or freezes called in scientific language?

A.—It is the point from which all reckoning of temperature by the Centigrade thermometer is made and is called naught degrees, expressed as follows: 0°.

59.—How many degrees are comprehended in a Centigrade thermometer?

A.—100°, that is from the point where ice melts to where water boils under a pressure of 760 mm. of mercury.

60.—Why does water in the condition of ice float in water in the condition of liquid?

A.—Because in the process of congealing, water increases its volume and is proportionally more porous and therefore becomes lighter than liquid water of the same bulk and floats responding to liquid buoyancy.

61.—Does this fact have direct bearing upon the study of the human body?

A.—It is of peculiar value in understanding influences of cold, exposure, etc., and the effects these have upon function.

62.—Is water a conductor of heat, and if so what kind of a conductor is it?

A.—It conducts heat very slowly. When water is disturbed evaporation greatly increases its conductivity.

63.—Is a knowledge of the slow heat conduction of water of value to the student of the human body?

A.—It is of great value in the study of temperature and in this connection it must be remembered that water gives off heat slowly in proportion, and that movement of it increases evaporation, also increases the giving off of heat. The student will see the importance of liquids in the body being kept in constant motion to insure equilibrium of temperature throughout the whole organism.

64.—Of what is water composed?

A.—It is said to be composed of two parts hydrogen to one part oxygen (H_2O). These gases in this proportion are obtained from water by analysis.

65.—Will two volumes of hydrogen mixed with one volume of oxygen undergo chemical synthesis and precipitate into water?

A.—It will not. An electric spark which is fire must be used to accomplish that result.

66.—In its ordinary state is water ever found that is not in the condition of a solution?

A.—No. Other substances are always mixed with it, and suspended in it, by the process of solution.

67.—In what way is the fact just stated of value to the student of the human body?

A.—It gives a basis for knowing the value of obtaining pure water for internal purposes, and indicates how easily carelessness as to what is held in solution in water might contaminate.

68.—How may water be obtained free from other substances?

A.—The one and only way is by the process of distillation. In other words by passing water back into its invisible gaseous phase and then securing a protected precipitation into liquid again. By this process all other substances except water are cast out of it.

69.—May water be kept in a distilled condition?

A.—Yes. But in order to do so it must be kept in an air-tight receptacle away from the light; even then it cannot be kept long.

70.—What is ozone?

A.—It is a peculiar modification of oxygen thus named on account of its smell.

71.—What is hydrogen?

A.—It is a transparent, colorless, tasteless and odorless gas. It is not poison though animals suffocate when immersed in it as they would in nitrogen. It is one of the most difficult gases to liquefy.

72.—What should be said of the weight of hydrogen as a gas?

A.—It is extremely light, being about 14½ times lighter than air, 11,160 times lighter than water and 151,700 times lighter than quicksilver.

73.—What standard as to gas is fixed by hydrogen measurement or weight?

A.—Hydrogen is the standard of specific gravity of gas and in this sense sustains the same relation to gas as water sustains to all other substances. The specific gravity of hydrogen is the unit of gas measure.

74.—What is the unit of hydrogen called?

A.—A liter of gas under standard conditions of temperature and pressure weighs .0896 g. This standard is called a *crith.*

75.—What is the standard of measure thus obtained called in relation to hydrogen?

A.—It is called *gas density* just as the relation of water is called specific gravity.

76.—When the density of a gas is given what does that signify?

A.—It signifies how many times heavier a given vol-

ume of gas is than the same volume of hydrogen under the same conditions of temperature and pressure.

77.—What is meant by the term diffusion?

A.—In the abstract it means to tend to move in all directions not disassociated from the law of gravitation but not conforming to the regular conduct of solid bodies.

78.—Is diffusion a prominent property of all gases?

A.—Yes. It is a property common to all phases of gas.

79.—Is conduct analogous to that of diffusion of hydrogen a physical fact as applied to all substances?

A.—Yes. To a limited extent all substances, of no matter what density, tend to move in all directions, except directly against gravity.

80.—What is the principal property of hydrogen in respect to diffusion?

A.—On account of its extreme lightness it has the greatest diffusion of any gas. Because of this fact it cannot be kept for any considerable time in any character of receptacle.

81.—Is hydrogen inflammable?

A.—Yes, very, but it has the peculiarity of extinguishing flames of any burning substance immersed in it. It will be understood that the immersion of a substance which is burning in hydrogen excludes the oxygen necessary to combustion.

82.—Are the facts just stated and those with relation to diffusion of gases important to the student of the human body?

A.—Yes. To understand diffusion of gases generally and the effect upon combustion of an excessive amount of nitrogen or hydrogen aids in understanding many of the peculiar phases of temperature observed in pathologic conditions.

83.—What is distinctive of the hydrogen flame?

A.—It is said to be very hot, but gives forth very little light and if it could be excluded from oxygen would give forth no light.

84.—Is the fact just stated of value to the student of the human body?

A.—Yes, when considered relative to combustion and temperature.

85.—When hydrogen is burned what results from the combustion?

A.—Water always results. The student will observe this answer gives him the basis for understanding all dropsical conditions.

86.—As compared with oxygen, what is the ratio of diffusion of hydrogen?

A.—It is in the ratio of four to one.

NOTE: With this brief quiz, if the student has understood and makes himself familiar with the information furnished, he will find himself possessed of a good working basis for the analysis of all relative subjects as touching the human body, and it must be remembered that to understand the facts relative to the human body is the sole object of this study outline.

PRINCIPLES OF ARCHITECTURE AND MACHINES

1.—What is architecture?

A.—It comprehends all and every character of buildings and in that sense includes all machinery.

2.—What is comprehended under the principles of architecture and machines?

A.—The physical laws that enter into, and control all phases of buildings or machine construction.

3.—What is the primary law of architecture or machine construction?

A.—That every structure must have a base or foundation upon which it rests or from which it operates.

4.—Does this law apply to both animate and inanimate buildings or structures?

A.—Yes, most fully.

5.—What is the second law of architecture or machine construction?

A.—That the superstructure must be vertically away from the base in buildings, and in a straight line from the base in machines in order to be in perfect equilibrium.

6.—To what extent may a building or other inanimate structure, not anchored, braced or otherwise supported, lean before it will fall?

A.—Until the line of gravitation falls outside of the base, or until more than half of the superimposed weight falls outside of the base or foundation.

7.—How do humans respond to the law in question?

A.—They do not lean, but react upon the base, projecting parts of themselves in different and opposed directions so as to maintain the center of weight, over the base or that upon which they rest.

8.—Is the fact in the last answer of value to the student of the human body in the study called Chiropractic?

A.—Yes. For it is fundamental to what is called compensation in the art of Relatolity.

9.—What is the third law of Architecture and Machines?

A.—The base should be parallel to the so-called horizon.

10.—What is the fourth law of architecture and machines?

A.—That the center of weight, or the line of gravitation, is always perpendicular from the base or is braced in such manner as to operate as though it were.

11.—Where a structure rests upon more than one base what principle is employed to unify the bases?

A.—The phase first used in mechanics; that of the bow, string and arrow, or the arc of a circle.

12.—How is the principle of the arc of a circle usually applied in architecture and machines?

A.—By means of perpendicular holding parts, connected by horizontal ones, stayed by braces usually at angles of forty-five degrees.

13.—May other means be used than the braces as indicated?

A.—Yes! The arc of a circle is frequently used, illus-

trations of which are seen in arches and other structures of the kind.

14.—Is the truth presented by the laws set forth in answers to 11, 12 and 13 of value to the student of human anatomy and of Chiropractic?

A.—Yes, these principles are fully employed in the human body (1) In maintaining equilibrium upon the two bases, the feet or structures substituted therefor, both dorso-ventrally, laterally and obliquely, (2) In compensating to maintain equilibrium, where basic or weight carrying structures are not in the same horizontal plane.

15.—In architecture and machines how are perpendicular, horizontal and oblique weight carrying parts and the braces supporting them fastened together?

A.—By mortises, pins, nails, splices, thongs, etc.

16.—Is a substitute for braces ever used to relate perpendicular and horizontal structures in machines or structures analogous thereto?

A.—Yes. Ropes, stays and guys made of many kinds of material are frequently used.

17.—What are similar to architectural or mechanical braces in the human body?

A.—Ribs, rami of the pubes, rami of ischii, clavicles, scapulæ, necks of the femurs, the curves in many bones, and so on.

18.—What is similar to mechanical ropes, stays, guys, etc., in human structure?

A.—Muscles, tendons, ligaments, membranes, aponeuroses, and all so-called soft structures not acting in the

vertical, the horizontal, nor at right angles from the part supported or held.

19.—What is the lesson to be derived from the answers thus far?

A.—That the human body is a structure and a machine, in every sense adapted to the terms employed in respect thereto, except that it has the remarkable power of distorting itself to keep in equilibrium which, to that extent, takes it out of the classification as a building and restricts it to a remarkable machine.

20.—What definite architectural and machine parts are observed in the human body?

A.—Direct and indirect supports, the base, fulcrum, lever, guy, tie, pulley, shaft, knuckle and many others and many combinations of these.

21.—How many of these have been considered?

A.—Direct and indirect supports have been entirely covered under the principles of architecture and machines, as has also the base and its various adaptations.

22.—What is a fulcrum?

A.—It is the base over, from or through which a lever is used. There are many fulcrums in human anatomy. The relation and use of the vertebral column, ribs and sternum; and the bony pelvis constitute them fulcrums, over, through and from which muscles as levers apply to move the various parts.

23.—What is a lever and how many kinds are there?

A.—The lever is an apparatus used to move objects and is usually a rigid rod, bar or wooden structure which is applied from a fulcrum, the end next to the operator

being called the application and that at the place of the thing to be moved the effort, the weight overcome is called the resistance. Levers are of three classes. In a lever of the first class, the fulcrum is between the effort and the resistance and is nearer to the resistance. In a lever of the second class the resistance is between the fulcrum and effort and is nearer the fulcrum. In a lever of the third class, the effort is applied between the fulcrum and the resistance, generally nearer the resistance but not always so.

24.—What is the law of the application of a lever?

A.—No matter in what direction the object is to be moved relative to the fulcrum, the lever is so applied that a relatively small effort overcomes great resistance. The principle is applied variously as seen in scissors, pincers, nippers, tongs and a multitude of other structures.

25.—Is the principle of the lever applied frequently in human structure?

A.—It is. The third class is definitely presented at the elbow joint by the relation of the bones and ventral muscles. The second class fully applies to the shoulder and the ribs. The knee and ankle present the first class. Some phase of the lever is applied with relation to every arthrodial joint of the body. The student should make a very careful and extended study of the subject of levers.

26.—What structures represent guys in the human body?

A.—All muscles, ligaments, tendons, and membranes that sustain an oblique relation to the supporting bones

of the area. The obliquus and transversalis muscles of the abdomen, the latissimus dorsi and intercostal muscles are splendid examples.

27.—What structures in the human body represent ties?

A.—Ligaments, membranes, aponeuroses, and all other structures that attach two or more bones or two or more other structures together; the principal service of such structure being to hold the parts in exact relationship or after use to return them to exact relationship.

28.—Is an illustration of the pulley found in the human body?

A.—Yes, definitely in the support of the superior oblique muscle of the eye, but by analogy in many other parts of the body.

29.—Is the shaft as known in architecture used in human structure?

A.—Yes, the turning quality by flexiousness of the vertebral column, with all muscles and other structures attached to it by origin and insertion, is illustrative of the line shaft of the manufacturing plant. The conduct of the joint of the shoulder and hip by which the humerus and femur are permitted to rotate in the glenoid cavity and acetabulum are other illustrations of line shafting. The rolling of the radius upon the ulna is another important illustration. By analogy the line shaft principle is carried out in many parts of the body.

30.—What are the illustrations of the mechanical knuckle found in the body?

A.—Practically all diarthrodial joints and also some

joints that are combinations such as the attachment of the bodies of vertebræ and the joints between the articular processes thereof. Also the four joints connecting the atlas and axis and the two joints connecting the occiput and atlas.

NOTE: The student is encouraged to take up the study of levers, braces, guys, ties, angles, stays and shafting fully and carry them through demonstrations in many kinds of machinery so as to be ready for the study of the anatomy of the human body.

WORD ANALYSIS

NOTE: It is not the purpose of this outline to take up the details of word analysis. It is merely the intention to make a few important explanations for the purpose of emphasizing the importance of the subject with the hope that the student will be inspired to set out with a determination to completely master the terms that are necessary to the expression of the science of Chiropractic.

1.—What is the one way in which science can be stated?

A.—By very well and carefully selected words; words which so near as possible express only the one meaning intended to be conveyed.

2.—Is it possible for a person to know a phase of science without first knowing and understanding the technical words of its expression?

A.—It is not. The student must either know the terms which give accurate expression to scientific thought, or he can not conceive such thought, understand it or give it expression.

3.—What is the relation of the importance of the study of terminology to all other study in the acquisition of scientific knowledge?

A.—It is the most important subject that the student can study, for words are the important means of conveying scientific thought.

4.—If one goes to a Chiropractic institution well versed

in a general way in language, does that render the study of terminology by him unnecessary?

A.—No; because he is to learn a new vocabulary with respect to anatomy, physiology, pathology and symptomology of the human body, and is to learn an entirely new set of words, either newly coined or given new meanings, for the expression of the science of Chiropractic.

5.—How are all words composed?

A.—They begin with the syllable. There are words of one, two, three and so on to many syllables.

6.—What are words of one syllable called?

A.—Root words, and what might be conceived as the units of expression.

7.—What are syllables placed in front of root words called?

A.—They are called prefixes.

8.—What are the syllables placed after root words called?

A.—They are called suffixes.

NOTE: The student at this juncture should be required to search out and give long lists of root words and words of one syllable that are the units of expression; then give a long list of words with one and two prefixes; then words with one and two suffixes. This practice should be continued until the student is not only able to give the general expressions necessary to anatomic study, but is adept and expert at the same.

9.—Why should the student form a complete knowledge of terminology before taking up the actual work pertaining to the study of the science of Chiropractic?

A.—Because an instructor must speak in the language of the science. There is no way in which he can simplify his expression and the student cannot progress rapidly unless he knows the meaning of the words the instructor must use.

10.—Can a student learn, without loss of time, by simply understanding the meaning of the words the instructor must use?

A.—Yes. However he must not only know the meaning, but he must know the analysis of each word used and its etymology.

11.—What is meant by the analysis and etymology of each word used?

A.—He must be able to select the right word; know what language it came from, and the general circumstances and origin of its use, and what time in social evolution it came into use.

12.—What is true of the prefix and suffix as respects analysis and etymology?

A.—He must be able to designate prefixes and know what language they come from, and the original meaning of each in that language. This is also true of suffixes.

13.—What fact does this phase of statement bring prominently to the student's mind?

A.—The fact that each word presents a history, not only as to its root, but as to each of its prefixes and suffixes and that unless this history is well understood, the meaning of the word cannot be known.

14.—Aside from creating an inspiration to learn terminology, what is the other object of this quiz outline?

A.—To teach the student to form the habit of using a dictionary.

15.—How often should the student use a dictionary?

A.—As often as he comes in contact with a word, the meaning, analysis and etymology of which he does not understand; or comes in contact with a word, the pronunciation of which he does not know.

16.—What is the preparatory work of the student in the use of the dictionary?

A.—He should familiarize himself with everything in the dictionary which occurs before the alphabetical list of words, and all that occurs after the alphabetical list, remembering that there is a college education in each dictionary of a language if the student only gets it out.

17.—Before taking up the actual list of words, what should be mastered?

A.—The student should master the diacritical markings which indicate the sounds of letters and the accent to be placed upon the various syllables.

18.—What is the next thing that he should master?

A.—He should learn the abbreviations that indicate the language from which the roots and syllables were taken such as Latin, Greek, Hebrew, French, German, Teutonic or what not.

19.—In their final significance what may words be said to be?

A.—Words are brief histories of human experience. These histories properly combined constitute language.

20.—How did name words come into existence?

A.—By the effort of individuals to indicate experiences

such as emotion, conduct, etc. It was in this manner that such words as love, hate, agony, ambition, marriage, work, horse, dog, and indeed all words came into use.

21.—What inspiration gave origin to anatomic names?

A.—Resemblance to other things already named in size, shape, relationship, color, density and use. There is one exception, the innominate or hip bones, the word innominate means nameless.

22.—What inspiration gave meaning to the terms used in physiologic, pathologic, and symptomologic expression?

A.—Resemblance in conduct to other things such as circulation, transportation, osmosis, percolation, assimilation, fever or super heat, minus temperature or subheat; pain, agony, excitement, passivity, frenzy, coma or comatose, spasm, composed, digestion, absorption, depuration, elimination and so on to the completion of the nomenclature.

23.—Where may the student, preparing for the study of Chiropractic, find means of attaining to much knowledge?

A.—The topical index in the back part of any standard anatomy contains substantially all anatomic and physiologic words and many pathologic and symptomologic also; if the student will take an unabridged dictionary, and make a careful study of those words for a sufficient time he will have placed himself in a condition to receive and understand the instruction necessary to the mastery of the science of Chiropractic.

GEOMETRY OF CHIROPRACTIC

1.—In what does the geometry of Chiropractic consist?

A.—It consists in figures of all shapes such as the globe or sphere, any part of a sphere, pyramid, oval, ovoid, round, cylinder, square, quadrangle, rectangle, triangle, circle, circular and so on.

2.—What is a globe or sphere?

A.—It is a body, all parts of the surface of which are equally curved and are therefore of equal distance from a common point within called the center.

3.—What are the subdivisions of a sphere?

A.—Half sphere, quarter sphere, eighth sphere, and so on to the smallest subdivision.

4.—What is an oval?

A.—It is a figure similar to, but not, a true sphere, also circular but not a complete circle and is otherwise called an ellipse.

5.—What is an ovoid body?

A.—An ovoid body is one that is in the nature of a sphere. Egg shaped.

6.—What is a pyramid?

A.—It is a solid figure, the sides of which present triangles which present a base with equally convergent lines all of which converge at a common apex. Pyramids are usually conceived as being four-sided. This however is not necessary.

7.—What is a square?

A.—It is a plane enclosed by four equal lines and four right angles.

8.—What is a quadrangle?

A.—A quadrangle is a plane enclosed by four lines and four angles.

9.—What is a rectangle?

A.—A rectangle is a plane enclosed by four lines and four right angles.

10.—What is a triangle?

A.—A triangle is a plane enclosed by three lines and these are conceived as being (1) equilateral, where all of the lines are of equal length and all angles are acute. (2) isosceles angled, where the lines are not the same length but the angles are all acute. (3) right angled, where the lines present one right and two acute angles. (4) obtuse angled, where none of the lines are the same length and one angle is obtuse and the other two acute. (5) scalene angled, where none of the lines are the same length but all of the angles are acute.

11.—What is the form of triangle most used in Chiropractic?

A.—The equilateral and the right angled triangle.

12.—What is a cylinder?

A.—It is a hollow figure having length, bounded by parallel curved lines of equal length, which in their aggregate present two parallel surfaces removed from each other by the thickness of the cylinder wall, and therefore differing in diameter in that proportion. The outside surface being convex, the inside being equally concave.

13.—What is the value to the student of Chiropractic of a knowledge of all the figures mentioned?

A.—He must use all of them in forming a correct conception as to the shape and relation of anatomic structures; but he must more definitely use them in the department of the art of Chiropractic.

14.—What geometrical lines are necessary to an understanding of Chiropractic?

A.—The so-called horizontal lines, the vertical, oblique and curved lines.

15.—For the purpose here, what is a straight line?

A.—A straight line is the shortest distance between two points and is conceived as presenting no width.

16.—What is a horizontal line?

A.—A horizontal line is a straight line said to be parallel with the horizon. In Chiropractic the horizontal line is said to be parallel with the horizon and at any elevation from it. Therefore, there may be as many horizontal lines as the imagination can conceive.

17.—What is a vertical line?

A.—A vertical line is a straight line which is precisely at right angles with the horizontal line. It is said to represent straight up or straight down; but it actually indicates straight out from, or straight into, the Earth.

18.—What is an oblique line?

A.—It is a line that is not parallel to any cardinal line, and yet when it connects such lines, it does so by an obtuse or acute angle; such angles, however, need not be equal.

19.—What is a curved line?

A.—It is a line not parallel with any cardinal line and presents no angles. It may therefore be any part of a circle, the surface of a sphere, oval or ovoid.

20.—What is a circle?

A.—A circle is a line all parts of which are equally curved and all parts of which are equally distant from a point within called the center. Of course, in Chiropractic such a line nearly always incloses all or some part of a figure and the circle is used for the purpose of fixing other lines and angles.

21.—What are the important parts of a circle to the student of Chiropractic?

A.—The arc of a circle which may be much or little of it, and the string, which connects two ends of the arc, by a straight line, and the arrow or radius of the arc, which extends from the center of the arc to the center of the string.

22.—Are the principles just mentioned importantly involved in the study of the human body and of Chiropractic?

A.—Yes. The arc of a circle, the string and radius of the arc are used frequently to gain a conception of the size and relation of structures involved. In the study of anatomy circles and all parts of circles are considered from the standpoint of solid bodies.

23.—How are circles and parts of circles used in the Art of Chiropractic?

A.—As lines, indicating shape and relation and are for the purpose of establishing other lines, which govern the direction of artful and corrective movement.

24.—What other facts of mechanics apply with respect to the arc of a circle, its string and radius?

A.—The conduct of the bow, which is disclosed by changes in its arc produced by the effect of its string, changing the length of the radius of the bow.

25.—How many degrees in a circle?

A.—360 degrees and therefore 180 degrees in a half circle, 90 degrees in a quarter circle and 45 degrees in one-eighth circle.

26.—What is the radius of a circle?

A.—A straight line from the center to the circumference.

27.—What is the novelty presented by a curved line?

A.—The novelty is that it is a line between two points which presents an arc of a circle or presents the arcs of many circles, in other words it is a line, no part of which is straight, yet no part of which presents angles.

28.—What is a plane?

A.—Anatomically a plane is a surface exposed by cutting through a body; the surface exposed being called a plane surface.

29.—How many planes are presented in the study of the human body and the art of Chiropractic?

A.—The horizontal, mesial, sagittal, transverse, coronal, oblique and curved.

30.—How many such planes may be exposed?

A.—The horizontal, vertical, mesial, sagittal, transverse, coronal, oblique and curved.

31.—What is a horizontal plane?

A.—It is a plane presumed to be parallel with the horizon.

32.—What is a vertical plane?

A.—One at right angles with the horizontal plane.

33.—What is an oblique plane?

A.—One that is not parallel with, but connects all cardinal planes either at obtuse or acute angles.

34.—What is a transverse plane?

A.—The surface exposed by a cross section at right angles with any other line or plane.

35.—What is a coronal plane?

A.—One that is presented at right angles with the vertical and parallel with the horizontal.

36.—What is a mesial plane?

A.—One exposed by cutting the body lengthwise in half. Sagittal planes are those parallel to the mesial, and there may be any number of them.

37.—What is a curved plane?

A.—A plane parallel with any curved line.

38.—Is there any such thing as a gravity plane in the human body?

A.—No; not when considering the whole body, for when considering all of its parts they are in equilibrium around a line called the gravity line. The gravity line is at different distances from the surfaces of the body.

39.—Is there a limited conception in which the term gravity plane can be properly used?

A.—Yes. When considering the body as a bilateral structure, we can speak of its gravity plane or when

considering two aspects of gravitation only, the word gravity plane can be properly used.

40.—What is the value of all the terms given in this department of the outline?

A.—They materially aid the student in arriving at a correct solution of anatomic distortions and approximating disrelationship and determining the lines and planes along which force must be applied in order to secure relation.

Note: The student is definitely urged to make every effort possible to attain to a complete knowledge of all these terms and to thoroughly familiarize himself with each.

HOW TO STUDY ANATOMY

1.—What is the method by which the study of anatomy should be pursued?

A.—By the process of deduction, that is, starting out with the idea that the human body is a machine, and that the first particle of which it is formed is the first phase of its machinery, and going on step by step with the addition of each particle until the entire human body is produced; and its anatomy and therefore its physiology is understood.

2.—Is it important to know where to begin the study of anatomy?

A.—Yes, it is of the utmost importance. A student should begin the study of the human machine just as he would any mechanism; therefore he should begin with the power department or the application of force to matter at the very beginning of the production of the machine.

3.—What important difference does the student find between inanimate and animate machinery?

A.—Inanimate machinery is always adult, that is full grown, and it is therefore only necessary to learn the size, shape, color, density and use of each part in order to know the relation of the parts, and to understand the machine. In the human machine, in a certain sense, it

never becomes adult for it is always undergoing the tearing down and building up process, during which time only analogy exists between animate and inanimate machinery.

4.—What department of anatomy then should the student begin with?

A.—With what we shall call developmental anatomy, which begins with the first granule, which by addition of other granules results in the full machine. Beginning then with conception and going from that, step by step, to full growth.

5.—What names should be given to these periods?

A.—Conception, bio-embryology, the zygote, embryo, and the fetus; and in extrauterine life; infancy, childhood, youth and maturity.

6.—In following the work as outlined, what fact must the student realize?

A.—That he is to isolate the novelty called the unit of tissue. This has been held to be the animal cell and he must carefully learn all about the animal cell, well realizing that what he is learning is true only by analogy. For cells are composed of smaller parts to the very limit of imagination.

7.—What are the principal parts of the animal cell?

A.—Limiting membrane, general cytoplasm, nucleus or germinal vesicle, nucleolus or nucleii the germinal spot or spots.

Note: For a wider discussion, the student is referred to the quiz on biology in this outline.

8.—What are the six departments into which the stu-

dent should classify the human body for his anatomic study?

A.—(1) Department of somatic body.
(2) Department of force.
(3) Department of intake.
(4) Department of liquid transportation.
(5) Department of use.
(6) Department of output.

9.—What constitutes the department of somatic body?

A.—The skeletal body and wall structures including the extremities.

10.—What constitutes the department of force?

A.—The brain and nerve system.

11.—Why should the anatomy of the brain and nerve system be the first, and, if there is any difference, the best known?

A.—Because they are the first parts produced, and are the anatomic parts through which all of the remainder of the body is produced, by a phase of mechanical conduct.

12.—What constitutes the department of intake?

A.—The digestion and respiration apparatus.

13.—Why do these stand next to the department of force?

A.—Because they are the media through which raw material is brought into the body in such a way that it may grow, in the first instance, and finally be maintained, after it has been developed.

14.—What is included in the department of liquid transportation?

A.—The heart and all of the blood and lymph vessels of every kind and character and all of the tubes of the body through which the thirty-two or more liquids are moved to the accomplishment of function.

15.—Why should these be learned next following the department of raw material intake?

A.—Because transporting the substances prepared to be used in the body through it to the places where they are to be used is third and, therefore, the next step in importance.

16.—What is included in the department of use?

A.—All of the so-called intercellular or intermolecular spaces of the body, in which the process of final elaboration and assimilation are constantly being carried on, which, of course, in a certain sense, includes the entire animate body.

17.—Does this include any machinery, in the sense in which we understand machines?

A.—No. This process takes place in the body where there is no machinery; but where force controls matter to specific conduct and formations, without the aid of any machinery comprehended by human mentality.

18.—What constitutes the department of output?

A.—All of the canals and tubes which lead from areas of assimilation and that lead from such areas first back into the blood in the veins; second, into the tubules that have eliminative orifices from the body such as the alimentary canal, sweat and sebaceous tubes that lead to the surface of the skin, etc.; third, to tubes that lead

from glands which do not have eliminative apparatus but which are in the line of depuration, and fourth, those glands that have eliminative tubes.

19.—How completely does the department of output comprehend the machinery of the body?

A.—It includes the output through the respiratory system; the output from the intestine in the form of feces; the output from the kidneys in the form of urine; the output from the ductless glands in the form of colloids, which has been erroneously called internal secretions; the output from all of the ductile glands; that from the glands of all mucous and serous membranes; the output in the form of sweat and sebaceous fluid through the glands of the skin; and the output from the tubes of the nose, ears, eyes, etc.

20.—What may the five departments last described be classified as constituting in the human body?

A.—They constitute the anatomy of vital function, and in that sense must be very thoroughly and completely understood.

21.—Is the anatomy of the soma and appendal parts any less vital than the five departments last described?

A.—No. From the vital standpoint these parts are just as animate as the others; but they sustain the relation of protection to the vital parts rather than actual vital offices.

22.—Are the parts just mentioned any more machinic or mechanical than the last five departments described?

A.—No. Their construction is very much more gross

and the machine parts are more exposed to the outside and are therefore better known; but all parts of the human body are equally mechanical.

23.—Why are the gross structures of the head, neck, trunk and extremities generally studied before those of the department of force, raw material intake, liquid transportation, use, and output?

A.—Because their mechanisms constitute the containing structures for the other apparatus and anatomic relation can only be definitely understood when the structure of containing media are well understood.

24.—What illustration of the last answer is found with relation to the department of force?

A.—That the bones of the head and face compose the receptacle or skull in which the brain, large ganglia and nerves are most carefully and safely maintained.

25.—What is an illustration with regard to the structures of the neck?

A.—That the cervical vertebræ and the very complete musculature of the dorsum and sides of the neck, the ligaments, membranes, aponeuroses and tissues generally, together with the mandible, are constructed to surround and protect the cervical portion of the vertebral cord, the visceral, or so-called sympathetic trunks, the cervical intervertebral nerve trunks, ganglia and the many other trunks incident to this area, such as the vagus, vertebral-accessory, the glosso-pharyngeal, hypo-glossal and so on to all trunks in the cervical region.

26.—What is an illustration of protection found in the trunk?

A.—The thoracic and lumbar vertebræ and sacrum are so constructed as to offer the highest form of protection to the vertebral cord, its ganglionic commisseurs, plexuses, and the trunks extending from it, including the cauda-equina, and all of the intervertebral nerve trunks. The thoracic vertebræ, ribs, sternum, diaphragm, intercostal muscles, and muscles of the chest and dorsum are so related as to constitute a splendidly well protected container for a large and important part of the liquid transportation machinery that is, the heart, large arteries, etc., and that portion of the respiratory system called the lungs, bronchial tubes and nearly all of the trachea. The lumbar vertebræ, the sacrum and the innominates, and also the muscular and membranous walls of the abdomen together with the diaphragm constitute a well protected receptacle for a large and important part of the digestive apparatus, the abdominal and pelvic portions of liquid transportation, and the departments of intestinal and urinary output, which include many glands; but particularly the spleen, liver, pancreas, kidneys, suprarenals, etc.

27.—What relation do the headward and feetward extremities sustain to vitality?

A.—(a) That of protection through the use of the headward and feetward extremities for repelling assaults, equilibrium and performing necessary work to provide sustenance; (b) protection that comes through the process of locomotion and the ascertaining and repelling of dangers incident thereto, such as violent contact with objects, falls, etc.

28.—Do the questions and answers so far reveal a very important fact to the student of Chiropractic?

A.—Yes. Since the structures just described so largely constitute containers for vital apparatus, the necessity of maintenance of exact anatomic relation for vital conduct becomes apparent; and it also becomes just as apparent that deviation from anatomic relation in containing mechanisms, relatively changes relationship of vital structure contained, thus enforcing distortion, hence producing disease.

29.—As a preparation for the study of the gross structures discussed what should the student familiarize himself with?

A.—He should familiarize himself with the embryonic origin of every tissue of the adult, that is to say, bone, cartilage, ligament, tendon, aponeurosis, fascia, muscles, membrane, glands, brain, ganglia, nerve trunks, and indeed every phase of structure.

30.—After having learned these things, into what two specific departments should the student divide the study of anatomy?

A.—Into topographical and analytical. Topographical consisting of a surface description of all parts. Analytical consisting of separating structures into consistent parts and learning the size, shape, color and density of all parts, and therefore the relation that each consistent part sustains in the complete segment, and the relation of such segments in the complete organism.

31.—From what two positions are anatomic structures described?

A.—From the person in the erect position and in the so-called dissection position, that is, with the person lying on the dorsum with thumbs out.

Note: The student must be careful when attempting to read anatomy to know what position the part is in that is being described, and it must always be remembered that in no matter what position, it is presumed that the hands are at the side with the thumbs out unless a different position is indicated.

32.—Are there descriptive terms which aid the student in understanding anatomy and having information concerning anatomy transmitted to him and transmitting information about anatomy himself?

A.—Yes. There are the following descriptive terms:

Mesial line—a line that would divide the surface of the normal body in half. There may be ventral, dorsal and lateral mesial lines.

Mesial plane—the plane exposed by cutting a body from one mesial line to a corresponding opposite one.

Sagittal plane—is one parallel to a mesial plane.

Coronal plane—is one parallel with the long axis of the body.

Horizontal line—horizontal plane—both of these are parallel to the horizon.

Mesial—means toward the mesial line or plane.

Lateral—means away from the mesial line or plane.

Internal—is also sometimes used to mean the same as mesial.

External—is sometimes used in the same sense as lateral.

NOTE: These terms are usually employed to designate within and without the cavities of the body.

Ventral—means toward the belly or front side of the body.

Dorsal—means toward the back or dorsal aspect or surface of the body.

Anterior—is sometimes used in the same sense as ventral.

Posterior—is sometimes used in the same sense as dorsal.

Superior—is generally used to mean toward the head, but it may mean any direction, depending upon the position of the part discussed; but it is always upward from the place, that is, away from the center of the earth.

Inferior—is generally used to mean toward the feet; but may mean other directions depending upon the position of the part. It always means toward the center of the earth from the place.

Headward—always means toward the head.

Feetward—always means toward the feet.

Cephalic and preaxial—have the same significance as headward.

Caudal or postaxial—have the same significance as feetward.

Proximal—is used to indicate a point near the area of description.

Distal—refers to a point further away from the area of description than that called proximal. This character of description should be confined to the extremities but is sometimes used generally.

33.—What is each cavity, shaft or part described as presenting?

A.—An axis called its axial line, which is a line running lengthwise of the structure equi-distant from all its surfaces.

34.—Do movements of parts of the anatomy also have axes?

A.—Yes. Every part is said to have an axis or axes of movement. If it moves in but one axis it is said to be uniaxial, in two axes, biaxial, in many axes, multiaxial, sometimes called poliaxial.

35.—What is the movement of a part called which moves in any axis from a common center?

A.—It is called circumductory movement.

36.—When a part is moved away from the mesial plane, what is that movement called?

A.—Abduction—the part is said to be abducted.

37.—When a part is moved toward the axis or mesial plane what is the movement called?

A.—Adduction—the part is said to be adducted.

38.—What other special division of anatomy should the student make to aid him in attaining to the knowledge which he desires?

A.—He should make the following classifications:

(1) Osteology—which includes all of the structures originally classified as the skeletal system.

(2) Arthrology—which includes all of the structures that enter into the construction of true joints and articulations.

(3) Myology—which includes structures that are mus-

cular and that are accessory to muscles, which include cartilages, membranes, fascia, aponeuroses, ligaments and tendons.

(4) Neurology—which includes the entire nerve system, that is, brain, brain ganglia and plexuses, other ganglia and plexuses, vertebral cord, nerve trunks, trunk plexuses, nerves, nerve plexuses and nerve ends.

(5) Angiology—which includes all of the structures of liquid transportation and the vessels and tubes through which the thirty-two or more liquids of the body are moved to the places of use and in the process of depuration and elimination.

(6) Aerotology—which includes the entire respiratory system and intertubular membranes between the alveoli and infundibula and the pulmonary capillaries.

(7) Alimentology—which includes all of the structures of the digestive system.

(8) Depuratology—which includes all of the tubes through which elimination is accomplished, alimentary, respiratory, the glands of the skin, and the kidneys and other parts incident to urination.

(9) Embryology—which includes the entire reproductive system of both the male and female and the stages—maturation, conception, zygote, embryo, fetus and delivery.

(10) Integumentary system—which includes all of the skins of the body, that is to say, serous and mucous membranes, the outside skin or integument, with its appendages, including the hair and nails.

(11) Splanchnology—the study of all of the organs

contained within the trunk is sometimes referred to by this term. It however is more definitely applicable to the period of embryology.

(12) Histology—which includes the beginning phases of presentation, gemmation and the beginning phases of the relationship in the construction of tissues. This is sometimes referred to as microscopic anatomy.

39.—What two terms are used as designations of lines of demarkation, etc.?

A.—Morphologic—which is a structural distinction. Arbitrary—fixed upon by agreement or custom without regard to structure.

Note: To illustrate the difference between the two, there is nothing in structure to indicate where the jejunum ends and the ileum begins. The point is fixed arbitrarily and the jejunum ends eight feet from its beginning.

To designate certain morphological structures we have the word "homology"—which means the same character of organs or parts produced in different animals. Organs are therefore sometimes referred to as being homologous in or to certain animals.

40.—What term is used to indicate a similarity or correspondence between parts of animals?

A.—We say that one part is analogous to another or that the parts are the same by analogy.

41.—To what class and character of animals does the human belong?

A.—To the vertebrata, the mammalia and to the genus homo.

NOTE: If the student will very carefully fix the anatomic suggestions herein given in his mind and make frequent reference thereto, he will find no difficulty in attaining to a mastery of anatomy. The author specifically urges each student to definitely strive for such attainment before attempting to comprehend the science of Chiropractic.

THE TRUTH ABOUT EATING

PREFACE

YES, we must eat, but why? Not for pleasure. Not to gratify nor satisfy our appetite. Not because things taste good. Not because we have formed the habit of eating. Not because we are hungry, because we do not know the meaning of the word. We eat just for the purpose of furnishing chemical necessities for our body upkeep and nothing else.—WILLARD CARVER.

HUNGER

1.—WHAT is hunger?

A.—Only a few persons ever experience it, and those not often enough to know the sensation.

2.—How may one know when he is hungry?

A.—He could only do so by observing the necessity for material to keep up the machinery, that is to say, the size, shape, color, and density of the tissue constituents of his body.

3.—Would the depletion of tissues be an infallible proof that a person is or has been hungry?

A.—No. Such results often occur as the result of excessive eating.

4.—When would depletion of tissue be proof that a person is or has been hungry?

A.—Only when otherwise in normal condition.

5.—May we say that moderns know the sensation of hunger?

A.—No. Civilized, modern humans have lost the intuitive consciousness of hunger. To civilized man the knowledge of hunger is a lost sense.

6.—Do animals of the jungle know when they are hungry?

A.—Yes. All of the so-called lower animals, not domesticated, that is, not contaminated by man, know instinctively when they are hungry.

7.—Do such animals know what they are hungry for?

A.—Yes. There is no question about it, they know by instinct just what they want and need.

8.—Do they know just what to eat?

A.—Yes. Instinctively they know that what they are hungry for is just what they should have for their good.

9.—Do they know just how much of what they want to eat?

A.—Yes. Exactly the amount and when they have eaten that much they instinctively know they have enough, and they quit eating.

10.—Will such animals take a substitute?

A.—No. If they cannot find what they are hungry for they just go hungry until they find that food or starve.

11.—Will such animals eat more than enough?

A.—No. They have no sense of future conditions, and if what they eat is the last of its kind ever to be, still they would quit when they had just enough.

12.—Does the human babe have intuitive sense of hunger or desire for food?

A.—No. It would starve within six inches of the mother's breast if not helped, and who has not seen the baby nurse as though hungry a moment after having spit up curd from an over-filled stomach.

APPETITE

13.—What is appetite?

A.—It is a mental habit.

14.—What is the scientific explanation of appetite?

A.—It is a mental expression which arises from a tissue habit.

15.—Can you illustrate the last answer?

A.—Yes. A person forms the habit of eating three times a day at fixed periods. His digestive apparatus has formed the habit of being titillated by food at those times and it suggests appetite to his consciousness and he thinks he is hungry. One forms the habit of using tobacco and has appetite for it almost constantly and the same is true of liquor and all of the narcotics or habit-forming drugs.

16.—Is the person hungry for tobacco, liquor, habit-forming drugs, etc.?

A.—No. Hunger could only apply to food. There are no food properties in any of the narcotics, therefore, one only has appetite for them.

17.—Has there been a destructive error with respect to appetite—the sensation that most people have thought to be hunger?

A.—Yes. It has been supposed that in eating one is perfectly safe if he follows carefully the dictates of appetite, when the fact is there is nothing worse that he could do, as witness the drug fiend who will risk his life, and starve for dope.

18.—Why is appetite not the criterion by which to select things to eat?

A.—We are born without appetite. We must learn to like everything that we eat and we learn to like—and to have appetite for—the things that are fed to us.

19.—Can what has just been stated be proved?

A.—Easily. The baby learns to like its Mother's milk. If the Mother has none for it, it quickly learns to like any kind of milk given it, and this notwithstanding that the milk given it may be very bad for the baby.

20.—What of different nations and peoples?

A.—Well! Nothing is better known than that all nations and peoples feed their children differently when they are old enough to wean. Witness the Chinese, Japanese, Indians, Spanish, French, Germans, Russians, the savage peoples of Africa, the islands of the sea, and particularly the Eskimos. Each child is fed according to the habits of those having it in charge and its appetite for various things is formed accordingly.

21.—Are there great differences in the things these babies learn to like and have appetite for?

A.—Yes. The Eskimo baby at weaning likes whale oil as well as a United States baby likes cow's milk and cries for it just as persistently and with just as much determination.

22.—Could the United States baby be taught to like whale oil as well as the Eskimo baby does?

A.—Certainly. And if the United States baby was taken to the Eskimo country and there taught, it would do as well on it.

23.—Would the United States baby at home form the same appetite for whale oil as it would for cow's milk?

A.—Precisely—if it was fed nothing else, and its appetite for it would be just as strong.

24.—Would the whale oil be as good for the United States baby in the United States as in the Eskimo country?

A.—No. But that would not affect its appetite for it.

25.—That "babies cry for Castoria," then, is not evidence that they should have Castoria?

A.—It is not—A baby of any size or age up to a hundred years and then some, can be taught to like and have appetite for anything no matter how destructive—witness quinine habitors.

26.—Has appetite a place in the selection of what one should eat?

A.—Generally speaking, no. However specifically, this must be observed, in considering things that one has learned to like, he should never eat any such thing, unless he has appetite for it.

27.—Is the fact that he has appetite for the given thing any proof that he should eat it?

A.—Not in the least. It might be the very thing of things that he should not eat at the time, or perhaps ever again.

28.—Aside from being a habit—how should appetite be classified?

A.—Appetite is an emotion—and like all emotions must be kept under the guard and direction of reason, in that department that we call will.

29.—If appetite is of no value in the selection of what we shall eat, why do we have that emotion?

A.—Simply for our pleasure, that is why we can learn to like and have appetite for anything, but must select only that which is good for us.

CHEMISTRY OF FOOD

30.—Has the chemistry of substances that may be eaten anything to do with their food value?

A.—Surest thing you know. The trouble is no person knows, nor can know, what chemical formula he should eat.

31.—Why does no person know, nor can know—what he should eat?

A.—For the simple reason that no one knows the chemical formula of human consistence—nor can ever know it.

32.—Do not the Therapeutic Physiologists assume to give the chemical formula of the human?

A.—Yes—and that formula was obtained by multitudinous analyses of the dead, and does not assume to be the analysis of a single human.

33.—Would an analysis of a dead human body be the consistence of that body animate and in health?

A.—No. For several reasons: (a) it has undergone the chemical change incident to the pathology of death (b) that phase of chemical formula necessary to animation left that body or changed in it when life left it (c) much of the consistence of the body is lost in an attempt to analyze it.

34.—If the things stated were not controlling, what else might be said of the hypothetical formula given by Therapeutic Physiologists?

A.—That no chemical analysis has ever yet been found that would synthesize—if the formula as given by therapy is correct, then mixing those ingredients according to that formula would synthesize into a human being—the sex question is involved—would it be a man or woman, nothing further need be said.

35.—Then is a knowledge of chemistry of any value in the selection of what one should eat?

A.—When one does not know his own chemical consistence, how shall he know what to take or what not to take—what to add or what not to add—what to subtract or what not to subtract. The answer is plain and simple—he does not and cannot, and a knowledge of all chemical laboratory experiments in the world furnishes not the slightest aid. The same substance, alcohol for instance, given to one hundred humans will present an array of one hundred effects—each person being affected differently.

36.—Give an illustration of the last answer.

A.—The administration of medicine is a guess. The administration of medicines would, by this time, be the

most certain thing in the world instead of the most uncertain, if what is stated in the answer to No. 35 is not true.

37.—What do you mean by the last answer?

A.—I mean that before the physician can write a correct prescription, he must know the exact chemical formula of the person to whom he would administer and since that is impossible, it is impossible for him to write a correct prescription, except by the miracle of accident or coincidence which sometimes occurs.

38.—Does the dilemma, the incompetency of the physician to write a correct prescription, apply to a person in the selection of food from a chemical standpoint?

A.—With the most painful exactness. When a person sets out to select substances for a meal, he is simply writing his own prescription, with no better opportunity for success from a chemical standpoint than the physician in writing a prescription. The situations are identical. The one who would eat does not know the chemical formula of his own body and does not know what substances to put into it.

39.—What help if any does a knowledge of chemistry supply?

A.—A knowledge of chemistry causes one to know that any healthy animal, vegetable, or fruit is a homogeneous compound within itself, and that therefore, the eating of just one thing, as nearly as possible in its original state, reduces the danger of chemical adversity to the minimum or smallest amount and thus dictates the use of a monodiet.

40.—Is there danger of chemical inhospitality even in the eating of one thing?

A.—Yes. The chemical formula of the thing eaten must come into contact with that of the eater, and the most profoundly adverse chemistry may result. However, where but one thing is eaten the damage is usually quickly overcome.

41.—Have you stated all that can be said for chemistry in the selection of food?

A.—Yes. Except what may be developed by ascertaining the vibrations of different chemical formulæ, which, however, appertains to a different phase of the subject.

STRUCTURE OF FOODS

42.—Has structure anything to do with the selection of foods?

A.—It has practically all to do with it. It has so much to do with it that I advise the slogan—disregard chemistry but select food solely by the structure of the substance to be eaten.

43.—Can you illustrate what you mean?

A.—Yes. The ruminating animal lives on grass and finds all the substances in it to produce all the structures in the body. The lion lives on fresh, raw meat and finds in it all substances necessary to the production and maintenance of all of its tissues, and so on throughout the entire animal world.

44.—What adaptation do you make of these facts?

A.—That all of the talk about variation of substances

to get all of the tissue salts and the various necessary ingredients for the composition of the body is complete error, and has usually been exploited by some interest for commercial purposes. The fact that the wild animals live well and thrive on single articles of food proves that man can do the same greatly to his benefit.

45.—What do you mean by structure from the food standpoint?

A.—The way the substance is composed. For example—milk may be said to be structureless—bread presents an artificial structure—celery presents a coarse, fibrous, vegetable structure—beef presents a coarse, fibrous, connective, animal structure—and so on, each thing presenting an individual and characteristic structure.

46.—From the structure standpoint, how should one select his food?

A.—One should select for food substances as much like the structure of his own body as possible—that is, a baby is a soft solid, hardly more than a colloid, and milk is his diet—as the fibers of his body harden and toughen, the fiber of his food must also harden and toughen. In other words, he digests well the substances that are similar to his tissues, when he avoids mixtures.

47.—What is the nature of the structure of the adult human?

A.—Coarse—tough—fibrous—even to the supporting parts of his viscera, including his brain and nerves.

48.—Are the facts just stated of value in the selection of articles of food?

A.—Yes, of the greatest value. If it is elected to eat meat—then the meat should be coarse and tough-fibered, and should be mature—no baby meat should be eaten by adults.

49.—What should be said of vegetables?

A.—That if the vegetable world is to furnish the food—then coarse-fibered vegetables should be selected, that, if not ripe, are nevertheless mature for adult consumption.

50.—What of the child's food between weaning time and adult maturity?

A.—At weaning time and during early childhood baby meat—such as veal, lamb, and young chicken, may be used—as may also tender and immature vegetables. This however should grade off as the years go and cease at adult maturity.

FRUIT—GRAIN—NUTS—MILK—EGGS

51.—What general statement should be made as to all of the articles mentioned in the aforegoing sub-title?

A.—That they all bear a certain nearness to procreation and embryonic food and in ratio to that nearness they lose value as food.

52.—Does the statement just made criticize the idea of selecting foods from chemical formulæ?

A.—Yes. It most certainly does. The articles named present the highest food value formula known, and that is their most objectionable feature. All procreative substances—such as semen and follicular fluid—present just

such characteristically high food formulæ, yet we know better than to eat them. We know that destruction follows eating them.

FRUIT

53.—But anyway, what of fruit for food?

A.—Fruit immediately relates to the seed of its kind, and in a certain sense is embryonic food, and therefore not the best for human food. Fruit contains no fiber except its delicate stroma and for that reason is most difficult to digest except by itself.

54.—If fruit is eaten how should it be taken?

A.—Always as a monodiet—never in combination with other fruits nor yet with any other foods.

55.—Should fruit be eaten?

A.—Yes. Under our present abnormal food conditions when nearly everything is cooked to the complete loss of its vitamine qualities, raw fruit taken by itself makes an excellent digestive rest—furnishes the body with the finest distilled water, and whatever its other deficiencies are, raw fruits are very rich in vitamine.

56.—How should fruits be eaten, if at all?

A.—Always by themselves—and when fruit is eaten just one kind should be taken and the eater should make a complete meal on that one fruit. He may eat another kind the next meal—but fruit should never be eaten at the same meal with anything else.

57.—What is vitamine?

A.—It is alcohol in its natural state as it is found in all substances that are nutritious. No matter how good

the chemical formula of a food substance is, it has no nutrition if it is denuded of its alcohol, either by heat in cooking or any other process.

GRAIN

58.—What should be said of grain as a food?

A.—The same thing that has been said of fruit, and more for the reason that it is easy to separate fruit from the germinal elements, the seeds usually, but it is next to impossible with grain, and so grain is not a high form of food.

59.—In what form does grain approach nearest to a good food?

A.—The whole grain, less the germinal elements, ground coarsely and so cooked as to permit and secure the formation of an artificial fiber.

60.—Is there a way, at present, of extracting the germ of grain before grinding?

A.—No; and that is the reason that breads and cereals cause so much fermentation—stomach and intestinal troubles—not to refer to general acidosis.

61.—If one is going to eat grain, how should he do it?

A.—Whole grain should be ground coarsely and put through the process to make what is called "light bread," so that it will form an artificial fiber—it should never be eaten other than cold and mixed with no other food in the mouth and should be masticated thoroughly—that is, chewed at least twenty crushes of the jaw.

NUTS

62.—What of nuts for human food?

A.—Nuts are in the same class as grain, only it is still more impossible to separate the meat from the germinal part.

63.—Aside from the objection stated what else should be said of nuts?

A.—They contain a very rich, fine, almost completely indigestible oil, which the human digestive substances can seldom emulsify.

64.—What of vitamine in nuts?

A.—Nuts are very low in vitamine in ratio with other components.

65.—What further would you say of nuts for food?

A.—Leave them to the squirrels and monkeys unless you are a nut or are nutty.

MILK

66.—What of milk as a food?

A.—Milk is the first food for all babies of the mammalia, that is, animals that nurse their young—hence milk nursed from the mother, other things being equal, is not only the appropriate, but the best food that can be had.

67.—When does milk cease to be appropriate or advisable food?

A.—At weaning time.

68.—What is the proof of the truth of the last answer?

A.—All the wild animals of the jungle instinctively

follow that course. At weaning time their young adopt the food of the mother, with certain modifications in some instances which she makes possible; that is, the tigress allows her weanlings to drink the fresh, hot blood of the killed victim, while learning to eat the flesh—the small nose of the faun, baby elk, and nearly all ruminating animals, in babyhood, enables them to get the tender succulent plants, avoiding the tougher fiber till their development needs it, and so on to all the young of the wild. However, it must be remembered that the food is of the character of that eaten by the adult animal—and humans must follow the same rule to be well.

69.—Is the human baby's mouth adapted to milk eating?

A.—Yes. The jaws are short, the lips back close to the neck, and therefore, the salivary glands very close to the forepart of the mouth, their ducts discharging right into the center of the lips.

70.—What should be said of the activity of the salivary glands of the baby?

A.—They are very active, discharging copiously at all times, but they are very active at the time of eating.

71.—What kind of eating does the short, soft, toothless, copiously liquidized mouth of the baby indicate?

A.—Nursing only, and in that act the milk drawn from the teat in many little streams is met at the lips at each nursing impulse with a gush of saliva and a thick ropy mucus. The saliva permeates the milk with the necessary influences for digestion, while the mucus slimes it over so that when it reaches the stomach the gastric juice

must first digest the mucus to get to the milk, which by that time is chemically prepared for it, and is digested, and not curdled.

72.—Can a baby take milk in such a way as to digest it in any manner except nursing?

A.—No; and there is no tragedy in life more grave than depriving a baby of his mother's breast.

73.—When it is necessary to raise a baby on the bottle what should be the construction of the nursing apparatus?

A.—It should be constructed as nearly like the mother's teat as possible, presenting many little orifices through which the milk is drawn by the baby's sucking mouth.

74.—Why should adults never take milk?

A.—Because the adult mouth is entirely changed from that of the baby—the jaws have become long and filled with teeth—the salivary glands have slowed down and do not discharge the same chemistry—do not discharge copiously, and the ropy mucus so richly profuse in the baby is entirely absent, and is replaced by only sufficient mucus of a thin nature for lubrication.

75.—Do the changes in the mouth set a fiat which humanity is bound to obey?

A.—Most certainly—and all persons beyond weaning time who do not conform to that fiat and leave milk alone, will pay the price of dereliction in disease.

76.—Has the adult stomach and intestine made corresponding changes against milk taking?

A.—Yes. The gastric juice has taken on an entirely

different chemistry, adapted to the digestion of tough, fibered substances, and the ridges, depressions, and recesses in the walls of the intestine have heightened and deepened, for the purpose of retarding the passage of coarse, tough, fibered things, in order to insure their digestion and onward passage, while absorption of their digested product is taking place.

77.—In view of the last statement what of milk?

A.—The stomach converts the greater part of it into an indigestible curd, much of which clings in the recesses of the stomach wall, undergoing putrefaction—and causes the effete breath of the adult milk taker, which is no more shocking than the condition of his alimentary canal, that is, his stomach and intestine.

78.—And what of the intestine?

A.—Of that part of the curd of milk that goes on into the intestine, only a small portion is ever reduced to a refinement that can be absorbed, which is fortunate for its chemistry is so changed that it will not assimilate into resistful flesh, but composes a soft-solid infiltration, that usually passes current for adipose or fat, which it certainly is not, but is a toxin that subjects its owner to almost any phase of disease.

79.—What of the residue in the intestine?

A.—The bile and pancreatic juice as a unified liquid breaks up the residuary milk curd in the intestine, not sufficient for absorption, but just right to cling in the recesses of the intestine, particularly the second half of the jejunum and the first half of the ileum and also the saccules of the large intestine generally, and the secum

in particular, preparing the way for all phases of intestinal inflammation, bilious fever, congestive fever, so-called typhoid fever, and so on, and still further preparing the way for the most profound and annoying constipation.

80.—Why do adults who quit all other foods and take milk only, seem to do well?

A.—Because milk is a liquid and for a time rests the overworked digestive system by permitting it to attend solely to the milk.

81.—Then why would it not be well to continue the sole milk diet?

A.—Because in a certain length of time in each case the stomach and intestine would become so loaded with putrefying, residuary particles, that the organism would undergo toxic prostration.

82.—What is the best advice to adults as to milk in any form which includes cream, sourmilk, buttermilk, etc.?

A.—Just leave them alone as you would a pestilence, and reap health and resistance as your reward.

EGGS

83.—What of eggs as food?

A.—Eggs are for "chicks" not strong enough to break the shell, and were made for that purpose only.

84.—What do you mean by the last answer?

A.—That an egg is not more nor less than a matured ovum—constructed to furnish food for the "Chick" which it takes by absorption directly, instead of by the

complicated process of placenta and umbilical cord of the uterine families.

85.—An egg is constructed to be the food of the young how long?

A.—Till shell cracking time—that is, until the end of the embryonic period—until the "Chick" is ready for post-embryonic life—which would be the same age for it as the human babe at birth.

86.—What of the chemical formula of the egg?

A.—It is among the very highest substances in nutritive elements, holding a close second to human semen and follicular fluid.

87.—Then why is it not a good food for human consumption?

A.—For the same reason that semen and follicular fluids are not fit to eat.

88.—Are there any other reasons why eggs are not fit for food?

A.—Yes. They are *without structure*—they are really nothing but a structureless protoplasm of the albuminous, proteid type and for that reason are not fit for human food.

89.—Is there further proof of the unfitness of eggs as food?

A.—Yes. The "Chick" never has egg for his food after he is out of the shell, of course I speak of the uncontaminated "Chick" of the jungle, and tame "chicks" fed eggs, have pip, cholera, etc.

90.—What general debilitating effect does the eating of eggs produce?

A.—Eggs are a dense, structureless albumen and if eaten must undergo profound mastication, which their lack of fiber and toughness renders impossible, hence when eggs are eaten, they reach the stomach unprepared to meet with the gastric juice, which at once hardens the albumen and crumbles it, preparing the way—not for absorption—but for deposit in the multitudinous recesses in the walls of the stomach—but more particularly the intestine throughout its length—thus slowly accumulating a putrefying mass from the stomach on to the end of the gut, with all of the dread consequences of a toxic alimentary canal.

91.—Will you name some of these dread consequences?

A.—Yes. Fetid breath—brain and eye troubles—liver, spleen and pancreatic abnormality—tending toward the production of bilious and congestive symptoms—enlargement of liver, spleen, or both—kidney or suprarenal abnormality or both—rheumatism of all phases—diabetes and Bright's disease—intestinal impactions, and the most stubborn phases of constipation—predisposes to malaria, typhoid, small pox, and all phases of disease which may be caused or aggravated by reactions from a toxic and irritated intestine.

92.—If one should determine to eat eggs, notwithstanding the certainty of injury, what is the least dangerous way of doing it?

A.—Raw eggs as a sole diet—which would finally stultify the stomach and intestine and render the whole organism so toxic that animation could not be maintained and death would result from some phase of disease,

caused by cumulative, intestinal poisoning and reactions in consequence of that phase of irritation.

GENERAL RULES

93.—Should the sick be fed?

A.—No. In ninety per cent of cases the person is sick because of errors in eating—generally because of eating too much, and what the digestive system requires is as nearly complete rest as possible while it is cleansing itself.

94.—On account of the mental adversity, not to say hysteria, against going without food, what would you suggest?

A.—Put the patient on a monodiet consisting of strained broth or soup with no solids whatever until the intestine has emptied, and until it has become clean and strong again.

95.—To what phases of abnormality does the recommendation just stated more particularly apply?

A.—All fever, or so called febrile conditions, without exception—rheumatism, paralysis, diabetes, so-called Bright's disease—in short, all phases of disease that may be caused or increased by a toxic bowel.

96.—What of cancer or tumor of the stomach or intestine?

A.—It is better not to feed per mouth at all—but to keep up the volume of the liquids of the body by injecting the normal salt solution per rectum.

97.—What of food following wounds and injuries?

A.—None should be administered, unless the strained

broth or soup, until shock and consequent fever have completely disappeared, and then only a monodiet of the very lightest food should be given until complete intention of the wound, fracture, or other injury.

98.—Why do you lay down the last rule?

A.—Because the organism needs all its attention and power centered to the healing or restoring process, and it frustrates that attention and process to be compelled to take care of food; and then it is often extremely dangerous to frustrate the restoring process by compelling the taxed organism to try to take care of food. President McKinley died as the result of that character of exposure. It is always safe and in all ways much better to go without the food.

99.—Why are you so sure you are right?

A.—Animals of the wild never eat, after having been injured, until they are recovered—the high per cent of deaths following major operations, in our great and small hospitals, is sufficient to convince any intelligent person that food following injury should not be taken until shock and reactive temperature have entirely disappeared at least.

100.—What can the practitioner do to overcome the general fear of the people of going without food—a little while—of starving in a few days if not regularly fed?

A.—Convince them that they do not get their strength from their food, but from their souls, in what they call nerve force. Have an authentic account of Dr. Tanner, of New York, who fasted forty days and forty nights, becoming well of a persistent heart disease and rheuma-

tism during the time; and then after an interim of thirty days, fasted under test conditions forty-two days, the first twelve of which he went without water even, and took a carriage drive each day of the fast thereafter, concluding the whole thing in better health than he had been for years, and lived on a strong, well man to a ripe old age.

GLOSSARY

(The syllable accented is followed by a hyphen)

ABNORMAL, abnor-mal—not normal; not usual; the operation of a law or laws opposed to the usual.

ABNORMALITY, abnormal-ity—having lost the equilibrium of function; a condition opposed to the normal.

ABORTIVE, abort-ive—any attempt short of success.

ABSORPTION, absorp-shun—The act of absorbing or being taken up as of a liquid or colloid; the normal operation by which liquids and colloids are impelled through channels in mucous membrane.

ABSTRACTLY, abstrakt-ly—generally; that is, not applied specifically; not applied to any definite thing.

ADHESION, adhe-shun—sticking together of unlike substances; growing to, or together, as viscera to walls, or viscera together.

ADJACENT, adja-sent—near to, or adjoining.

ADJUSTING, adjust-ing—The various movements, directions and phases of force applied to correct a distortion. A word formerly used in Chiropractic.

ADJUSTMENT, adjust-ment—a word formerly used in Chiropractic; now not correctly used; in the former sense the final result of all efforts to adjust when they resulted in relation.

AERATION, aera-shun—the process whereby atmospheric gases are taken into the transpitory liquids of the body through the lungs and the means by which certain gases from the same liquids are eliminated through the same channels.

AFFERENT, af-ferent—coming to a given point. Formerly used with respect to certain nerves, which were supposed to transmit impulses to the brain; the conception being erroneous, the word should be no longer anatomically used.

ALBUMEN, albu-men—a thick, viscous, nitrogenous substance, or

chemical compound, entering as a constituent into almost all parts of the body.

ALCOHOLISM, al-koholizm—the morbid results of the continuous and excessive use of alcohol by means of the alimentary canal.

ALIMENT, al-iment—generally a substance ingested for food, specifically nutritive substance.

AMEBOID, ameb-oid—having inherent power of motion, as of the parts of a cell.

ANEMIA, ane-mia—a name given to a condition resulting from tissue starvation because of a lack of assimilation.

ANESTHETIC, anesthet-ik—that which produces partial or entire abeyance of apprehension, either locally or generally; usually confined to the narcotic chemicals, but broadly includes suggestion.

ANESTHETICS, anesthet-iks—plural of anesthetic.

ANALYSIS, anal-isis—separating into component parts, and tracing each part to its origin as well as its present relation.

ANALYSES, anal-ises—plural of analysis.

ANALYTICAL, analit-ikal—having the power of analysis; in the manner of, or pertaining to an analysis.

ANASTOMOSIS, anastomo-sis—the growing together by their mouths of two or more branches of a vessel so as to form one.

ANIMATION, anima-shun—the act or state of being animate, the conduct performed by the smallest particles of matter impelled by life force which relates such particles according to a specific plan and maintains such relationship.

ANKYLOSIS, angkylo-sis—the fixation of any tissue but especially joints or articulations by an exudation from bones or a deposit of calculus, gummata or other solid residue.

ANTISEPTIC, antisep-tik—not poisonous; cleansing.

APHONIA, afo-nia—loss of voice.

APICAL, a-pikal—at or in relation to the apex.

APPREHENSION, apprehen-shun—generally applied to feeling, but broadly includes all ways of obtaining information.

APPROXIMATION, approksima-shun—a conclusion approaching

truth; sufficiently near for a given purpose; the act of reaching such conclusion.

ARBITRARILY, arbitrar-ili—without morphological separation; without inherent reason therefor.

AREA, a-rea—the surface of anything.

ARTHROLOGY, arthrol-ogy—a discussion of structures and methods of arrangement of the components of joints and articulations.

ASCITES, asi-tez—infiltration into the abdominal cavity.

ASPIRATION, aspira-shun—a surgical operation in pleurisy and other conditions of dropsy where a hollow needle is projected into the cavity of the body and the fluid drawn off through it.

ASSIMILATION, assimila-shun—the normal conduct by which particles of matter are impelled by life force into such relation as to construct and maintain tissue.

ATOM, at-om—an ultimate particle of matter.

ATROPHY, at-rofi—to wither or lessen in size abnormally; usually without catarrhal disintegration.

AUTO-POISON, au-to poi-zn—poison of self by abnormal chemical combination.

AUTO-SUGGESTION, au-to sugjes-chun—self-suggestion; an affirmative suggestion by the mind to the self, or soul.

AXIS, aks-is—an imaginary line extending from pole to pole of a sphere; an imaginary line passing through a body or lumen equidistant from all surfaces.

AXIS CYLINDER, aks-is sylindr—a nerve composed of bare, elongated, gray cells and their connections.

BASE, bas—the bottom of anything or that upon which it rests.

BASIC, bas-ik—having relation to the bottom of a thing or the fundamental from which deduced.

BASIS, bas-is—that upon which anything rests or is based.

BASES, bas-es—plural of basis.

BEAUTY, bu-ti—an assemblage of elements constituting a whole, conceived to be pleasing to the sight of the observer.

BEVERAGE, bev-eraj—any fluid, or mixture of a fluid character, which is drunk; usually confined to water and liquids.

Bi-concave, bi-kon-kave—having concavity in opposite directions.

Bi-convex, bi-kon-veks—having convexity in opposite directions.

Calcification, kalsefika-shun—the process of becoming calcified, or the accumulation of solid residues of acid.

Calculi, kal-kuli—plural of calculus.

Calculus, kal-kulus—the acid and earthy residues from certain abnormal chemical combinations in the body; usually referred to as lime deposits.

Calice, kal-is—also chal-ice—a small cup-like space.

Calices, kal-isez—plural of calice.

Cavity, kav-ity—Anat., an enclosed sac between viscera or walls which is wholly occupied by viscera, fluid or air.

Cell, sel—Anat., the protoplasmic, basic portion of tissue.

Cellular, sell-ular—being composed of cells.

Cervical, ser-vikal—of or pertaining to the or a neck.

Channel, chan-nel—a way or place made for passage such as the lumen of an artery, vein or lymph vessel; also thus used in connection with nerves, in the transmission of life force.

Chiropractic, kiroprak-tik—literally a practice by hand; comprehensively the science which teaches health in anatomic relation; disease or abnormality in or from distortion; and teaches the method of securing anatomic relation by hand.

Chiropractor, kiroprak-tor—one that believes in the science of Chiropractic; a Chiropractic advocate, incorrectly used to designate a practitioner of Chiropractic.

Chyme, kime—the substance resulting from the admixture of saliva and food substance with the chemical exudations from the glands of the stomach.

Chyle, kile—the substance resulting from the admixture of chyme in the small intestine, especially the duodenum, with the glandular exudations, usually referred to as bile and pancreatic juice.

Clinic, klin-ik—generally instruction in symtomology, diagnosis, relatolity and the art of relating, being of three kinds, technical clinic, demonstrative clinic, and practice clinic; also the place where such instruction is given.

Clinics, klin-iks—places where clinic instruction is given; the instruction given and the persons upon whom demonstrations are made.

Clinical, klin-ikal—of or pertaining to clinic or clinics.

Clot, klot—the solids remaining of blood or lymph after the chemical changes which permit the separation of the solids from the fluids, and the coagulation of the solids.

Cohesion, kohe-zhun—the sticking together of surfaces of like substances brought very near to each other, such as the surfaces of plate glass when pressed together.

Commissure, kom-misur—a crossing between two things; the extension of fibers of two things or parts into each other; usually confined to the nerve system and is the means by which its by-lateral parts are constructed to perform unit conduct.

Complication, komplika-shun—existing as an incident to a usual process, which renders it more complex.

Concenter, konsent-er—where the diffused elements or parts are directed toward a given center or area.

Contiguous, kontig-uous—in touch; in immediate relation with.

Constriction, konstrik-shun—a closer approximation of parts than usual or normal, as in longitudinal cells of a muscle, fascia, etc.

Co-ordinance, ko-or-dinans—things acting together to secure a result, phases of normality or abnormality.

Costal, kostal—having relation to the ribs.

Cough, kof—the expulsive, muscular, and expiratory function for the removal of accumulated substances from air passages.

Creation, krea-shun—Anat., the act of bringing certain chemical elements into co-relation in such manner that when acted through by life force—nerve stimulus, they become animate.

Decay, deka—the process of separating into original elements.

Deduction, deduk-shun—the act of reaching a new truth from another, or several others, in harmony with, and necessarily included in, the same; also the truth so reached.

Defecation, defeka-shun—the nerve and muscular functional

activity normally employed, to eject the feces from the rectum.

Delirium, delir-ium—a peculiar form of temporary insanity.

Delivery, deliv-eri—the expulsion of the fetus from the uterus and vagina; also the assistance of such function by the accoucheur.

Depuration, depura-shun—the application of life force in the removal of disintegrated and residuary matter from areas related to assimilation; the conduction of such substances into the veins; into the tubules of glands; or to some eliminative orifice.

Diaphragm, di-afram—the muscular septum which divides the cavity of the trunk into the thorax and abdomen, being the largest and most powerful muscle of the body.

Diastole, dias-tole—expansion or dilation; referred to the dilation of the heart and arteries following systole.

Dietetics, dietet-iks—facts and theories relative to eating.

Digestion, dijes-chun—the process by which substance taken for food is admixed with the several chemical formulæ exuded from the walls of the alimentary tract, and thus reduced to such small particles as to be capable of being absorbed through the villi and other absorptive glands of the intestine.

Disease, dizez—not easy; any condition sufficiently removed from the normal so that the sensations are not pleasant.

Disintegration, disintegra-shun—the act of separating into parts; also the result of such separation.

Displacement, displas-ment—the condition of being out of its regular place; not sustaining the usual relation; physiologically—a movement out of static relation to accomplish a specific result, such as the movement of the components of a joint; it may be physiologic or pathologic.

Dizziness, diz-iness—a peculiar mental abnormality in which the sensation of the loss of equilibrium is paramount.

Dormant, dor-mant—still, quiescent, not normally active; may refer to any condition less than normal activity.

Dorsum, dor-sum—the back.

Dorsal, dor-sal—having reference to the back.

Dorso-headward, dor-so-head-ward—toward the back and head.

Dorso-feetward, dor-so-feet-ward—toward the back and feet.

Ducts, ducks—tubes through which liquids and colloids are propelled through the body, usually from glands to points of elimination or reservoirs or into vessels or other tubes.

Dysmenorrhea, dismenore-a—painful menstruation.

Ease, eze—in passivity; the state of being at rest or satisfied.

Efferent, ef-erent—away from a given point.

Efficacy, ef-fikasy—having power to produce results.

Eggs, eggs—a baby food for young fowls; the albuminous food for a chick during the embryonic period, sometimes incorrectly used as a food for humans.

Element, ele-ment—primitive parts, or primary constituents.

Elemental, element-al—pertaining to the primitive parts or primary constituents.

Elimination, elimina-shun—the act of expelling or projecting from the body, sometimes incorrectly used as interchangeable with depuration.

Emotion, emo-shun—the influence of the soul upon the material body producing all of the attributes of consciousness and the desire to resist gravity, and other opponent phases of force, and to accomplish the art of standing and of all the other movements incident to locomotion.

Endosmosis, endusmo-sis—liquids or colloids passing through an abnormal membrane, not through organized channels into a cavity.

Enema, en-ema—the injection of water or fluid into any of the tubes of the body through their orifices, primarily for their cleansing; generally confined to the bowel and vagina.

Epidemic, epidem-ik—abnormality of a peculiar character, occurring simultaneously in a certain locality, produced by certain environmental irritants.

Epiphysis, epif-isis—the later osseus developments in cartilage on the ends of bones.

Epiphyses, epif-isez—plural of epiphysis.

Epithelium, epithe-lium—a word originally without definite

meaning; now used in the sense of peculiarly classified cells upon a basement membrane, on any surface, internal or external.

Equilibrium, ekwilib-rium—the condition of being normally balanced; in proper parts and relationship.

Evolve, evolv—to originate or rise up; to construct or refine.

Exiter, eksit-er—a substance not being a food that taken into the alimentary canal causes disturbed conduct, some phases of which appear to be too active; the composit being less than normal conduct such as alcohol, whiskey, etc.

Exosmosis, exosmo-sis—liquids or colloids passing through an abnormal membrane, not through organized channels, out of a cavity.

Expiration, exspira-shun—the impulse and muscular activity involved in expelling air from the lungs; also the substance expired.

Extension, eksten-shun—extending from one point toward another, or to another; and the condition of doing either of these.

External, ekster-nal—toward the outside; away from the median line; the outside.

Exudation, eksuda-shun—liquids or colloids oozing from glandular structures or from lascerations or contusions; such conduct being either normal or abnormal; also the act of so oozing.

Facet, fas-et—a little face; a small articular surface, as the articular facet on the neck of a rib.

Fascia, fash-ia—the unnamed muscular tissues of the body.

Fermentation, fermenta-shun—a disintegration or separation into original elements in such a way as to be classified as being soured or rancid; containing such incongenial elements as to be gaseous.

Fever, fe-ver—elevated temperature; the result of increased friction, from coarsened vibration, lessened cohesion, and increased disintegration; all the result of interference with the transmission of life force.

Feet-ward, feet-ward—in the direction of the feet.

FEET-DORSAL, feet-dorsal—toward the feet and dorsum or back.

FEET-VENTRAL, feet-ventral—toward the feet and belly or front.

FEET-VENTRO-LATERAL, toward the feet, belly and lateral aspect.

FEET-VENTRO-MEDIAL, toward the feet, belly and mesial plane.

FEET-DORSO-LATERAL, toward the feet, back and lateral aspect.

FEET-DORSO-MEDIAL, toward the feet, back and mesial line or plane.

FIBER, fi-ber—a thread.

FILAMENT, fil-ament—generally a small thread or fiber; with reference to the nerve system a very small fasciculus.

FILTRATION, filtra-shun—the passage of liquids or colloids through abnormal membranes, not through organized channels, into a cavity; also the result of such conduct.

FIRST INTENTION, first inten-shun—a surgical term used to indicate the production of neoplasm to unite fractured or severed parts, usually incorrectly confined to the union of bones.

FIX, fiks—to become stationary or to be in a position stationary; inactive.

FIXATION, fiksa-shun—the act of becoming fixed or rigid.

FIXED, fikst—the state of being stationary or rigid.

FLACCID, flas-sid—being limp by reduction in the size of cells and also reduction in the amount of fluids that should be contained, such as an abnormally reduced tissue.

FLEXION, flek-shun—the condition of being bent; the act of bending.

FLEXUOUS, flek-shuus—so constructed as to have spring or elasticity as contra-distinguished from the eccentric movement of true joints; such as the movement permitted between the bodies of vertebræ from the axis throughout the remainder of the column; the condition of being thus constructed.

FORAMEN, fora-men—an opening, generally through or between bones, cartilages, or other resistant tissues.

FORAMINA, foram-ina—plural of foramen.

FUNCTION, fungk-shun—the various activities of an organ by which it accomplishes its office; also the office accomplished.

GANGLION, gang-glion—cells occurring upon nerves where they

change their relation or fellowship as in a plexus; a ganglion may consist of one or many such cells.

GANGLIA, gang-glia—plural of ganglion.

GANGLIATED, gang-gliated—having ganglia, such as the caudate nucleus, gangliated cord, etc.

GIBBOSITY, gibbos-iti—generally considered to be the most dorsal area of the thoracic curve of the vertebral column; but in fact the most convex aspect of any curve of the vertebral column, whether normal or abnormal.

GLAND, gland—lymphoid substance so organized as to bring the lymph into certain contact with the substance of disintegration in such manner as to produce a specific chemical change.

GLYCOGEN, gli-kogen—a chemical by-product analogous to grape sugar, produced or aggregated in the liver.

GROSSER, gros-er—the comparative degree of gross; less refined.

GRUMOUS, grum-ous—thick, clotted blood, or similar to clotted blood.

GUMMA, gum-ma—the solid residue occurring in certain phases of abnormality, primarily of the consistence of jelly, but later becoming hard.

GUMMATA, gummat-a—plural of gumma.

GURGITATE, gur-jitate—the flowing of liquid or colloid in a disturbed or occluded manner.

HARMONY, har-moni—being in exact relation to constitute a whole; producing quiescence.

HEAD-WARD, head-ward, towards the head.

HEAD-DORSAL, head-dorsal—toward the head and back.

HEAD-VENTRAL, head-ventral—toward the head and belly or front of the body.

HEAD-DORSO-LATERAL, toward the head, back and lateral aspect.

HEAD-DORSO-MEDIAL, toward the head, back and mesial line or plane.

HEAD-VENTRO-LATERAL, toward the head, belly or front of the part, and lateral aspect.

HEAD-VENTRO-MEDIAL, toward the head, belly or front of the part, and the mesial line or plane.

HEAT, heet—the phenomenon produced by friction accompanying

assimilation and disintegration, which has not quite correctly been called combustion.

HEREDITY, hered-ity—the tissue tendency transmitted from an ancestor or from ancestors through the process of reproduction.

HYPERSENSITIVE, hipersen-sitive—more than usually sensitive, abnormally sensitive.

HYPOTHESIS, hipoth-esis—the proposition upon which a conclusion is based, which may be a fact or theory; usually the question of fact or theory has not been solved, therefore, an assumption as of fact for the purpose of further induction.

HYSTERIA, hister-ia—a peculiar form of temporary insanity.

IDEALISM, ide-alizm—a quasi-religion placing theory above fact, or rather maintaining that theories, because they have been perceived, are facts.

IMMUNE, immune—protected; rendered safe.

IMPOTENCE, im-potens—the condition of having less than normal power; especially referred to procreative organs, as applied to which, it is inability of either the male or female to perform normal sexual intercourse.

INDUCTION, indux-shun—the development of a new theory, conception, system or method by the process of imagination; guesses that may be found true by deduction and demonstration; the act of performing such mental operation.

INFLAMATION, inflama-shun—formerly spelled inflammation, a tissue condition in which there are concomitantly a stased circulation with morbid accumulation and elevated temperature.

INFILTRATION, infiltra-shun—osmosis; the transmission of liquids or colloid through abnormal membranes, not through organized channels; the condition resulting from such process.

INNATE, innate—in dwelling; that which is inherent or is a part of a thing from its inception.

INOCULATION, inokula-shun—the act of purposely or accidentally projecting poison into the lymph, as the virus called vaccine, and that of small-pox or syphilis; the condition of having been so poisoned.

Insanity, insan-iti—broadly, any deviation from the normal. Specifically, any process of minding aside from the normal.

Insulation, insula-shun—that which separates substances so that there is no communication between them. Nerve System, that which separates nerves so that stimulus is not transferred from one nerve to another; also the condition of being thus separated.

Interatomic, interatom-ik—between atoms.

Interlobular, interlob-ular—between lobes.

Intermolecular, intermolek-ular—between molecules.

Interstices, inter-stises—the spaces between, as spaces in trabecular structure; a network.

Irritant, ir-ritant—that which produces an opposed, incongenial, or inharmonious influence beyond tissue resistance. Physiol., constituent chemicals in abnormal amounts in a compound.

Irritation, irrita-shun—the act of irritating; the condition of being irritated.

Isolation, i-solashun or is-olashun—the act of separating a substance from other substances, as a chemical from a compound.

Junction, jungk-shun—the point or line at which two things meet.

Kenetic, kenet-ik—having relation to the soul; soul force; the force of life which does not depend upon matter; that phase of force that constructs, maintains and causes all of the conduct of the human organism, which we call animation.

Kinetic, kinet-ik—the energy or force resulting from the movement of a mass of matter.

Kyphosis, kifo-sis—being abnormally gibbous; in the vertebral column, the apparent increase of any dorsal curve by two ventral ones; the abnormal lessening of any ventral curve.

Lacteals, lak-teals—named from the substance contained being milky; the ducts of the villi of the small intestine.

Laity, la-iti—those undisciplined in any of the recognized professions.

Lateral, lat-eral—away from the mesial line or plane.

Latero-feetward, toward the lateral aspect and the feet.

Latero-headward, toward the lateral aspect and toward the head.

Leucorrhea, lukore-a—a thick, mucoid discharge from the vagina; a catarrhal process occurring in the vagina, uterus, or both.

Leukocytes, lu-kosites—cells of a peculiar nature that grow among the epithelial cells lining the sinuses of lymph glands, usually called lymph corpuscles.

Line, line—in printing one-twelfth of an inch, otherwise conceived to have no width.

Lobulated, lob-ulated—a structure composed of parts called lobes.

Lordosis, lordo-sis—abnormally curved ventrally; as of the vertebral column.

Lumen, lumen—the cavity, or space for a cavity, in any of the tubes or sacculations of the body.

Lumbar, lum-bar—pertaining to or near the loin—small of the back.

Luxation, luxa-shun—a complete dis-jointing; where the holding elements are injured until the joint surfaces are entirely separated; the condition of being so dis-jointed.

Lymph, limf—the water of the thirty-two or more fluids of the body containing in each instance certain percents of solids and gases held in solution; in relation to blood it is called plasma.

Lymphoid, limf-oid—like lymph structure, of the nature of lymph.

Mass, mas—an aggregation of substances; generally comparatively large; specifically, without functional organization.

Material, mater-ial—the apprehendible, environmental, chemical constituents composing things or substances; as contradistinguished from extra environmental, inapprehendible conceptions. Illustrations: Environmental, the earth; extra-environmental, the soul.

Materialist, mate-rialist—one that believes that all that is, is environmental, or apprehendible as a substance.

Materia Medica, mate-ria med-ika—that branch of medicine

which teaches the constituents and formulæ of internal medicine, and all substances used as remedial agents.

MEDIAN, me-dian—a point half way between two given points.

MEDIAL, medial—toward the mesial line or plane.

MEDIO-FEETWARD, toward the mesial line or plane and the feet.

MEDIO-HEADWARD, toward the mesial line or plane and the head.

MEDULLATED, med-ullated—covered; usually has reference to nerve trunks ensheathed in the white substance of Schwann.

MELANCHOLIA, melanko-lia—a mild form of insanity in which, on account of occlusion of stimulus to the brain, the phenomena of life and environmental relationship are conceived to be distorted and opposed. The process is vulgarly called the "blues."

MENINGES, menin-jez—the three membranes constituting two sacs around the brain and vertebral cord.

MENOPAUSE, men-opauz—the normal cessation of the discharge of the menses.

MENSES, men-sez—the periodic discharge of fluid from the walls of the uterus, normally occurring each twenty-eight days.

MENSTRUAL, men-strual—of or pertaining to the menses.

MENSTRUATION, men-struashun—the act of discharging the menses; also the period of such discharge.

MENTAL, men-tal—of or pertaining to the mind as distinguished from the soul.

MESIAL, me-zial—of or pertaining to a median point or line.

MILK, milk—a lacteal fluid, being white and somewhat heavier than water, containing nearly all of the properties of the chemical formula of the human body; a baby food produced to supply the needs from birth to the production of the teeth, after that period, incorrectly used as a food.

MIND, mind—a function of the brain; the result of the operation of those cells of the cortex of the brain, especially charged with the function of producing the process of minding; in that particular respect not differing from the production of blood in the body, or any other function.

MORBIDITY, morbid-ity—derived from the word morbid in the

sense of being dead; therefore, disintegrated inanimate substances in or retained in the organism.

MORPHOLOGICAL, morfoloj-ikal—physical, material, as contra-distinguished from arbitrary.

MOTOR NERVES, mo-tor ner-vez—those nerves through which movement or motion is controlled.

NARCOTISM, nar-cotizm—the effects from consuming narcotics; the addiction to the use of one or more of the habit-forming drugs.

NATURAL, nat-ural—all that exists; every phase of phenomena.

NEOPLASM, ne-oplazm—new material of similar character to replace deorganized tissue; generally, pertaining to fractures, cuts, and bruises; but broadly, the substance used to replace disintegrated cells throughout the organism.

NEUTRALIZE, nu-tralize—to render inactive, as of a poison.

NERVE, nerv—a number of elongated cells connected together at the extremities in such manner as to form a gray axis cylinder.

NERVE ROOTS, nerv rootz—aggregations of nerves from different sources concentering to form a trunk.

NORMALITY, normal-iti—the process or state assumed to be normal.

OCCLUSION, okluz-un—suppression, checking, hindering, retarding, interfering with, stopping or lessening in its channels as of nerve stimulus; also the condition of being effected by such process.

ORGAN, or-gan—a part of the organism assumed to perform one or more functions.

ORGANIC, organ-ik—of or pertaining to an organ.

ORGANISM, or-ganizm—the entire body; specifically, with respect to its function.

ORIGIN, or-ijin—the beginning.

OS, oss—bone.

OSSIFIC, ossifik—containing bone granules; like bone.

OSSIFICATION, ossifika-shun—the process or act of changing to bone.

OSMOSIS, osmo-sis—the passage of liquid or colloid through ab-

normal tissue, as a result of occluded stimulus, usually to lining membranes.

Ova, o-va—the primitive, animate cells produced by the ovaries of the female. The female gamete.

Ovum, o-vum—singular form of ova.

Oxidation, oksida-shun—taking on oxygen; the process by which a substance receives into itself oxygen.

Pain, pane—any emotion that causes the individual, not ease, or lack of ease.

Parenchyma, pareng-kima—the proper substance; the pulpy part of glands, etc.

Palpation, palpa-shun—the ascertainment of conditions by apprehension; by touch; also the act of apprehending by that process.

Parasites, par-asitz—animals or germs that live upon other animals or germs.

Parietes, pari-etez—the walls.

Passivity, passiv-iti—the condition of not being active; quiescent.

Percussion, perkush-un—the ascertainment of conditions by apprehension through the medium of sound; also the art of ascertaining conditions by that process.

Periphery, perif-eri—a distal termination or end, as of a nerve.

Peripheria, perif-eria—distal terminations or ends.

Per Se, per se—in itself; through or by itself.

Perversion, perver-shun—contrary to the normal, generally in the reverse of the normal; almost wholly confined to functional habits, which of course includes the mental.

Phenomenon, fenom-enon—any occurrence or thing, material or psychic.

Phenomena, fenom-ena—plural of phenomenon, including all nature; all that exists.

Plexus, pleks-us—an aggregation of nerves for the purpose of changing fellowship and extending in different directions and into the composition of new trunks, always accomplished by means of gangliation.

Plexuses, pleks-usez—plural of plexus.

PREMONITORY, premon-itori—known, felt, or impressed before hand.

PRIMORDIAL, primor-dial—of or pertaining to the origin or beginning.

PROTOPLASM, pro-toplazm—primitive material; the first form of animal matter recognizable.

PUBERTY, pu-berty—the period at which the male develops the power to beget and the female the power to conceive.

PUBES, pu-bez—the region related to the pubic bones.

PULSE, puls—the diastoles of the arteries, therapeutically conceived to be the impulse of the heart beat, but, in fact, the normal dilation of the artery following its normal systole or contraction under the impulsion of stimulus.

PUS, pus—disintegrated, solid residue from tissue.

RAMIFY, ram-ify—to extend branches into.

RAMIFICATION, ramifika-shun—the process of ramifying, or the condition of being ramified.

REACTION, reak-shun—acting in the reverse direction; the process of returning to the normal.

REARRANGE, rearranj—to leave the present arrangement for another; change of course or relationship, as of nerves in a plexus.

REGION, re-jun—area; scope; or place.

RELATION, rela-shun—the position which component parts occupy to construct segments, parts or the complete organism.

RELATIVITY, relativi-ty—the aspects and phases of relation.

RELATOLITY, relatol-ity—the condition of being in relation, such as the human body when in health.

RELATOLOGY, relatol-ogy—a discussion of relation and its many incidents.

RELATOR, re-lator—one who understands and practices the art of securing relation; definitely, one who understands the art of Chiropractic.

RELATORY, re-latory—the place where one who understands the art of securing relation performs that art.

REFRACTING, refrak-ting—bending.

RESIDUE, rez-idu—that which remains after a process.

Residual, rezid-ual—of or pertaining to the remainder.

Resistance, rezist-ans—the quality of maintaining place, relationship and function against an adverse force.

Rotational, rota-shunal—the condition of being turned aside obliquely; curved to one side circularly.

Scavenger, skav-enjer—germs which evolve to deorganize morbid tissue or accumulations.

Science, si-ens—the systematic arrangement of facts appertaining to a given thing.

Scoliosis, sko-liosis—an oblique, rotational, curvature of the vertebral column.

Segment, seg-ment—a part or portion of a thing.

Sensory, sen-sori—of or pertaining to consciousness.

Septum, sep-tum—a partition.

Shock, shok—temporary, partial withdrawal of animating force from the brain and nerves as the result of injury; or adverse and destructive suggestion.

Sinus, si-nus—a depression, furrow or groove.

Situs, si-tus—in place; in normal relation as of the components of a joint or articulation.

Spine, spine—a long sharp point, as the ends of the spinous processes of human vertebræ; too generally but incorrectly referred to the vertebral column, that is in no sense a spine; but is a column of articulated segments.

Stasis, sta-sis—the area of lessened, retarded, or stopped liquid transportation.

Stases, sta-sez—plural of stasis.

Stased, sta-sed—checked, retarded, or stopped, as of the liquids of transportation.

Stimulus, stim-ulus—the energy or force which acts through the brain and nerves, constructing and maintaining the body, and controlling all of its functions.

Stimulant, stim-ulant—a nutritive element; that which may be taken into the body and used in its economy.

Subluxation, subluxa-shun—chronic dis-relation of joint surfaces, because of injury to one or more of the holding elements; the result of sprain, laceration, contusion, patho-

logic disintegration or enlargement, or a combination of such injuries.

SUGGESTION, sugjes-chun—any information acquired in any manner.

SUPPURATION, suppura-shun—the production of pus; the substance so produced.

SWEAT, swet—liquidation of perspiration upon the surface of the skin.

SYSTEM, sis-tem—all of the parts of a functional process; also the organs necessary to a function.

SYSTOLE, sis-tole—the normal periodic contraction of the heart and arteries.

TEMPORARY, tem-porari—transient; that which is not permanent.

TERMINAL, ter-minal—of or pertaining to the end.

THEORY, the-ori—an undemonstrated assumption.

THERAPEUTIST, therapu-tist—one that advocates or practices some branch of therapy.

THERAPY, ther-api—that which treats of the discovery and application of remedies for diseases.

TORTUOUS, tor-tuus—winding; devious.

TOUCH, tuch—apprehension by contact.

TRABECULAR, trabek-ular—of or pertaining to trabecula or trabeculæ; like a net-work.

TREATMENT, treetment—the application of remedies to a disease to change, palliate, or remove it.

USUAL, u-zhual—regular; according to rule; normal.

UNUSUAL, unu-zhual—irregular; not frequent; not according to rule; abnormal.

VACCINATION, vaksina-shun—the process of inoculation of pus to produce a disease, upon the theory that the disease produced in a mild form, will prevent its production in a malignant form.

VENTER, ven-ter—belly or front surface of anything.

VENTRICLES, ven-trikles—the chambers or cavities in the brain and the apical chambers of the heart.

VESICLES, ves-ikles—the sacs or reservoirs of the body, as the bladder and seminal vesicles.

Virus, vi-rus—pus; a poison principle.

Viscus, vis-kus—one of the organs of the body.

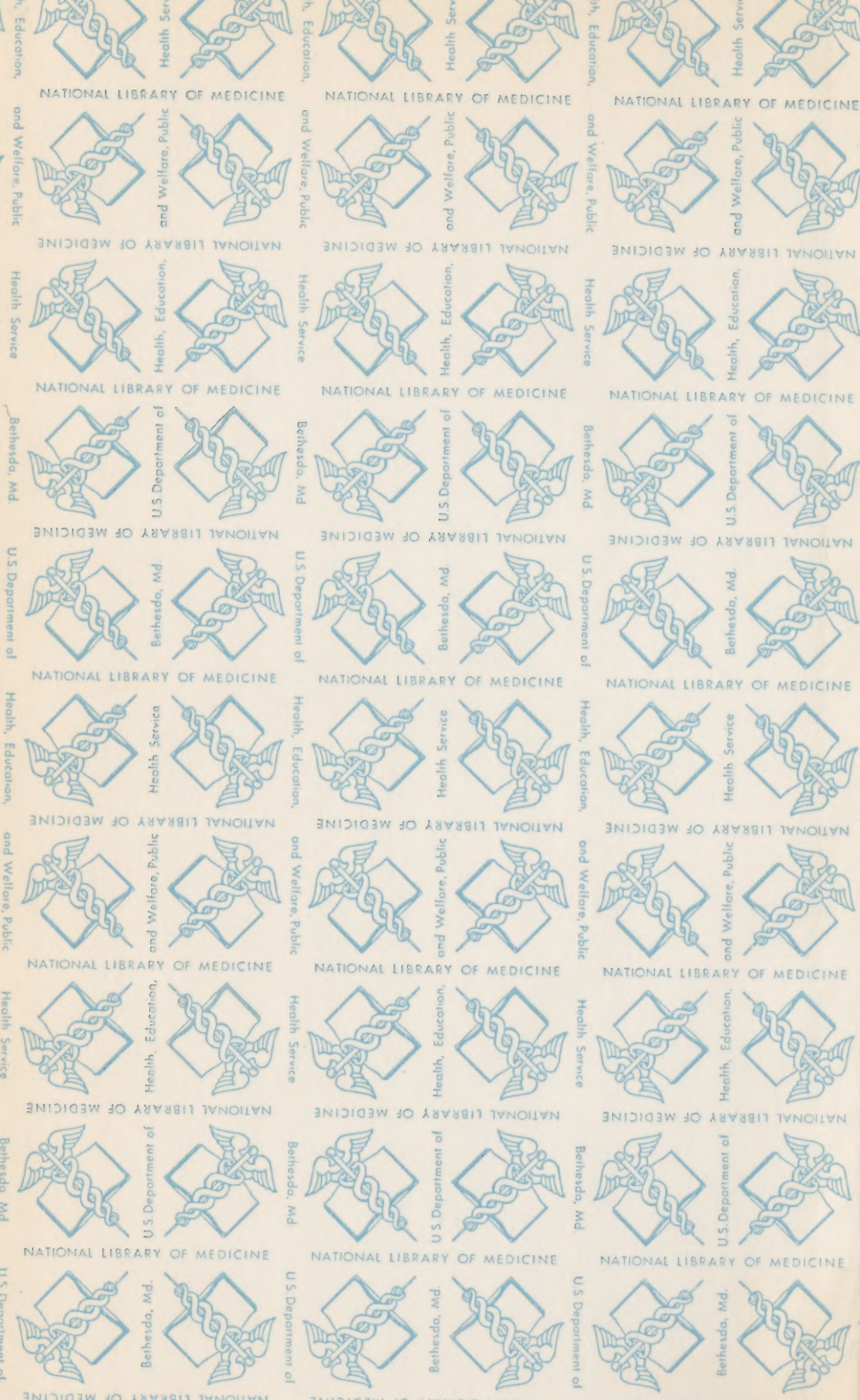
Viscera, vis-era—the organs contained within the cavities of the body.

Visceral, vis-eral—of or pertaining to viscera.

Voracious, vora-shus—greedy; insatiable.

Walls, wawls—usually, the side boundaries; broadly, that which encloses.

Will, wil—the affirmative or active impulse of the minding process.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